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DIAGNOSTIC STUDY TO DETERMINE POVERTY LEVELS IN CARICOM FISHING COMMUNITIES

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**Diagnostic Study to Determine Poverty Levels in CARICOM
Fisheries Communities – Technical Document**

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Diagnostic Study to Determine Poverty Levels in CARICOM Fisheries Communities –Technical Document

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Foreword

Within the Caribbean region, fishers and their communities are often characterized by sub-standard living conditions, poor housing, low levels of formal education; inadequate access to basic services like water, schools, health care; inadequate access to credit and low savings; poor infrastructure such as roads or markets; and limited alternative employment opportunities. In the past, there have been many initiatives aimed at reducing poverty. Unfortunately, many of these have failed in their objective of significantly reducing or eliminating poverty. This failure has been attributed to the tendency to focus on promoting economic growth and development through the application of technology, investment in infrastructure projects and the application of market oriented economic policies, rather than being focused on improving the living conditions of the poor based on an in-depth understanding of the underlying causes of poverty.

It is now widely recognized that poverty is a very complex, multi-faceted issue that varies considerably from country to country and from community to community. The Diagnostic Study to Determine Poverty Levels in CARICOM Fishing Communities will assist us in better understanding and defining the nature, extent and underlying causes of poverty in a comprehensive and scientific manner. This will assist national and local governments and interested organisations in developing and implementing more focused interventions aimed at improving the quality of life of fishing communities by dealing with poverty and the underlying factors that give rise to it in an informed manner.

The Diagnostic Study was conducted in ten selected CARICOM countries – Barbados, Belize, Grenada, Guyana, Jamaica, Montserrat, St. Kitts and Nevis, St. Vincent and the Grenadines, Trinidad and Tobago and The Bahamas. The main objective of the Study was to assess poverty levels in fishing communities, including its effects on quality of life and community structure, in order to identify suitable planning models and implement alternative livelihood and poverty alleviation programs in these communities. A secondary objective was to identify the demographic and socio-economic variables underlying low standards of living.

The report of the Study is presented in two Volumes. Volume I contains the full Technical Document. It is organized into five sections which provide an introduction to the Study, including a description of the methodology; background information on the history, geography, demography, socio-economic and political aspects of the CARICOM region; the findings of the Study; the recommendations; and an introduction to the concept of alternative livelihoods. The report of the Regional Validation Workshop, 1 - 2 February 2012, St. Vincent and the Grenadines is published as Supplement 1 to Volume I. Volume II is a Policy Document in which the main findings and the recommendations are summarised.

It is hoped that the findings of this Study will not only contribute to a greater understanding of poverty and its effects on quality of life in fishing communities across the CARICOM region, but that it will also assist in the identification and development of alternative livelihood projects and programmes that will positively impact the livelihoods of Caribbean fisherfolk and their families, while promoting the sustainable use of the fisheries resources.

I would like to extend our sincere thanks to the Kingdom of Spain for the funding and technical assistance provided through AECID under the Caribbean Community (CARICOM) / Kingdom of Spain Scientific and Technical Cooperation Agreement. Also, we would like to thank the Spanish consultants, Tragsatec, who in collaboration with the CRFM Secretariat and the Member States, undertook the Study and prepared the reports.

Milton Haughton
Executive Director
CRFM Secretariat

Table of contents

List of tables and figures	ii
Tables	ii
Figures.....	iv
Charts.....	vi
Boxes.....	vii
Acronyms and abbreviations	viii
Presentation of the document	x
Structure of the report.....	x
Acknowledgements	xiii
EXECUTIVE SUMMARY	xiv
I. THE STUDY: METHODOLOGICAL APPROACH.....	1
1. Poverty: definitions, measurements and causes of poverty	1
2. Methodology.....	5
2.1 Country Selection	5
2.1.1 Criteria.....	5
2.1.2 Methodology	6
2.1.3 Results	7
2.2 The Survey.....	7
2.2.1 The Questionnaires	7
2.2.1.1 Household questionnaire.....	8
2.2.1.2 Fisherman questionnaire	10
2.2.1.3 Aquaculture questionnaire	11
2.2.1.4 Processing questionnaire.....	13
2.2.2 Sample Survey Design	14
2.2.3 Information system	20
2.2.3.1 Data entry	21
2.2.3.2 Data Analysis.....	22
2.2.4 Training Workshop	23
2.2.5 Field Work.....	24
2.3 The Analysis	26
2.3.1 Main problems	26
2.3.2 Analysis methodology	27
2.3.3 Unsatisfied Basic Needs (UNB) Index	27
2.3.4 Fisheries Activity Indicators	31
2.3.5 Poverty Indicators.....	32
2.3.6 Clustering.....	33

2.4	Regional Workshop	35
3.	Lessons learned	37
4.	The Diagnostic Study and the Poverty Assessments carried out in CRFM Member States	38
II.	INTRODUCTION TO THE CARICOM REGION	39
5.	General context	39
5.1	Historical setting	40
5.2	Geography and climate	41
5.3	Territorial organization	42
5.4	The Society and Policy	43
5.5	Institutional Structure	44
5.6	Demography	44
5.6.1	Population: structure, size and growth	45
5.6.2	Demographic indicators	46
5.7	Economy	46
5.8	International and Regional Relations	47
5.9	Regional Planning	48
6.	Fishery Sector	49
6.1	Overview of Caribbean Fisheries	49
6.2	Main challenges for the development of the fishery sector in CARICOM countries	50
6.2.1	The need for information systems	50
6.2.2	Fishermen organization and co-management	51
6.2.3	IUU fishing	51
6.2.4	Critical Issues Affecting MCS	52
6.2.5	The problem of hurricanes	53
6.2.6	Aquaculture	53
6.3	The Caribbean Regional Fisheries Mechanism (CRFM)	53
6.4	Policy and planning	54
6.5	Organization and management of the fisheries sector in CRFM Member States	55
6.5.1	Regional Level	55
6.5.2	National Level	55
6.6	Major International Treaties on Fisheries ratified by CRFM Member States	57
6.7	International and Regional Organizations involved in Fisheries Management	57
III.	MAIN FINDINGS OF THE STUDY	59
7.	The Nature of Poverty in Fishing Communities of the CARICOM Region	59
7.1	Quantitative Analysis of poverty levels of fishing communities: Key Poverty and Vulnerability indicators	59
7.2	Qualitative Analysis of poverty levels of Fishing Communities	61
7.2.1	Geographic distribution of poverty	61
7.2.2	Demographic characteristics of the poor	74

7.2.3	Perception of economic situation of households.....	78
8.	Description of social and economic status in Fishing Communities of the CARICOM Region.....	82
8.1	An overview of the fisher's way of life.....	82
8.1.1	Description of the sample studied.....	82
8.1.2	Fishing activity	97
8.1.3	Living conditions.....	100
8.2	Labour market issues: employment generation in the fisheries sector	114
8.3	Credits and Savings	119
8.4	Education and skills.....	121
8.5	Health and social benefits	124
8.5.1	Health	124
8.5.2	Social Benefits.....	125
8.5.2.1	The social security system	125
8.5.2.2	Subsidies.....	126
8.6	Fleet and fleet Productivity	126
8.6.1	Fleet	126
8.6.2	Productivity	127
8.7	Impact on the economy	129
8.7.1	Contribution of small-scale fisheries to household economies.....	129
8.7.2	Contribution of small scale fishing activity to food security.....	130
8.7.3	Contribution of small-scale fisheries to local economies	131
8.7.4	Contribution of small-scale fisheries to economic growth at the national level	134
8.8	Impact of the environment on fishing communities. Vulnerability to natural hazards	137
8.8.1	Environmental issues	137
8.8.2	Natural hazards.....	137
8.9	The role of women	142
8.10	Fisheries co-management.....	146
8.11	Main concerns of the fishery sector.	148
9.	Status of the aquaculture subsector.....	149
10.	Remarks on the processing industry	164
IV.	RECOMMENDATIONS: TOWARDS POVERTY REDUCTION IN FISHING COMMUNITIES	177
11.	Recommendations.....	177
11.1	Recommendations related to the improvement of policy processes.....	177
11.2	Recommendations related to social issues	178
11.3	Recommendations related to education and skills.....	179
11.4	Recommendations related to impact on economy	180
11.5	Recommendations related to the improvement of fisheries management....	181
11.6	Recommendations related to fisheries co- management	184
11.7	Recommendations related to women empowerment in fisheries	185
11.8	Recommendations related to vulnerability to natural hazards.....	187
11.9	Recommendations related to the protection of the environment	187
11.10	Recommendations related to the aquaculture industry	188

V. ALTERNATIVE LIVELIHOODS	192
12. Income generating activities	194
13. Fisheries Livelihoods Assessment	195
14. Proposal for Livelihoods Assessment	197
14.1 Phase 1:	197
14.2 Phase 2:	198
14.3 Phase 3:	199
14.4 STEP-BY-STEP Guide to carry out the Phase 3 in a Fishing Community	205
14.5 Phase 4:	208
14.6 Phase 5:	208
14.7 Phase 6:	209
APPENDIX I: Countries Profile.....	211
THE BAHAMAS.....	211
BARBADOS	219
BELIZE.....	228
GRENADA	238
GUYANA	246
JAMAICA.....	258
MONTSERRAT.....	270
SAINT KITTS & NEVIS	275
ST VINCENT & THE GRENADINES.....	285
TRINIDAD AND TOBAGO	293
APPENDIX II: Data Exploration Guide	305
APPENDIX III: Questionnaires	339
APPENDIX IV: List of participants in the Training Workshop.....	366
APPENDIX V: List of participants in the Validation Workshop	381
APPENDIX VI:Pilot Projects working groups of Validation Workshop.....	384
References.....	395

List of tables and figures

Tables

Table 1. Countries Rating	7
Table 2. Number of questionnaires collected for each country	26
Table 3. Basic needs, dimensions and variables	29
Table 4. Basic needs variable scores.....	30
Table 5. Total Population in CARICOM countries (2011 estimations) Source: CIA Fact book	45
Table 6. Number of Unsatisfied Basic Needs for the entire fisheries sector. 10 selected countries.....	59
Table 7. Types of households Unsatisfied Basic Needs by country	61
Table 8. Poverty distribution over the 10 selected countries	62
Table 9. Poverty distribution among the 10 selected countries differentiated by fisheries sector	63
Table 10. The extent of poverty on households of fisheries sector in Bahamas.....	63
Table 11. The extent of poverty in households of fisheries sector in Barbados	64
Table 12. The extent of poverty in households of fisheries sector in Belize	65
Table 13. The extent of poverty in households of fisheries sector in Grenada.....	65
Table 14. The extent of poverty in households of fisheries sector in Guyana.....	66
Table 15. The extent of poverty in households of fisheries sector in Jamaica	67
Table 16. The extent of poverty in households of fisheries sector in Montserrat.....	67
Table 17. The extent of poverty in households of fisheries sector in Saint Kitts and Nevis ..	68
Table 18. The extent of poverty in households of fisheries sector in Saint Vincent & the Grenadines	69
Table 19. The extent of poverty in households of fisheries sector in Trinidad & Tobago	70
Table 20. Main Constraints in vulnerable houses of Bahamas, Barbados, Montserrat and St Kitts.....	71
Table 21. Main Constraints in vulnerable and poor houses of Saint Vincent and Trinidad and Tobago	72
Table 22. Main Constraints in vulnerable and poor houses of Grenada.....	72
Table 23. Main Constraints in vulnerable and poor houses of Jamaica.....	73
Table 24. Main Constraints in vulnerable and poor houses of Guyana and Belize	74
Table 25. Sources of contribution in poor household's income.	79
Table 26. Sources of estimated income in US\$ to cover expenses of each member of poor households' studied.....	80
Table 27. Ability of making savings or indebtedness of poor households in the fishing sector	81
Table 28. Ownership of durable goods in The Bahamas	101
Table 29. Ownership of durable goods in Barbados.....	103
Table 30. Ownership of durable goods in Belize.....	104
Table 31. Ownership of durable goods in Grenada	105
Table 32. Ownership of durable goods in Guyana	107
Table 33. Ownership of durable goods in Jamaica	108
Table 34. Ownership of durable goods in Montserrat	110
Table 35. Ownership of durable goods in Saint Kitts and Nevis.....	111
Table 36 Ownership of durable goods in Saint Vincent and the Grenadines	112
Table 37. Ownership of durable goods in Trinidad and Tobago	113
Table 38 Urgent needs of the neighbourhood per countries	114

Table 39. Contribution of the Fisheries Sector to Direct and Indirect Employment in 10 selected Caribbean States.....	115
Table 40. Fishing activities carried out by Fishermen's household members.....	117
Table 41. Fishing activities carried out by Aquaculture producers' household members.....	118
Table 42. Fishing activities carried out by workers in processing sector's household members	119
Table 43. Percentage of fishing communities' households with access to loans by country	120
Table 44. Percentage of fishing communities households that manage to save money making ends meet.	120
Table 45. Presence or absence of training related to fishery sector received by the interviewees in the last 5 years	123
Table 46. Type of training received by country.....	124
Table 47. Presence or absence of important illness or disability within the respondents of fishing, aquaculture and processing sectors.....	124
Table 48. Household presence or absence of important illness/disabilities in fishing, aquaculture and processing sector	125
Table 49. Participation in a social security system	125
Table 50. Percentage of fishermen who received a subsidy in the last five years	126
Table 51. Fleet productivity based on quantities landed and price of first sale.....	128
Table 52. Fleet productivity based on units of power and hours dedicated to fishing	128
Table 53. Fleet productivity by member of the crew.....	129
Table 54. Fishing importance on household's economy	130
Table 55. Percentage of self-consumption of the household's catch by country.....	131
Table 56. Distribution of cost required (in percentage) per fishing vessels and per country	134
Table 57. Percentage of fisheries sector contribution to GDP Source: National Fisheries Offices. 2010.....	134
Table 58. Shows shares of fish and fish products consumption of selected CARICOM states Source: Faostat. 2007.....	136
Table 59. Main causes of decreasing catches and sizes (according to fishermen) by country	136
Table 60. Type of Hazards suffered.....	139
Table 61. Percentage of women interviewed in each country within each sector	143
Table 62. Women Full-employed in processing sector	144
Table 63. Women Full-employed in Aquaculture sector.....	144
Table 64. Percentage of fisherman that consider they are consulted by the fishing administration as part of the decision- making processes.....	147
Table 65. Percentage of fisherman familiar with policies, strategies and plans	147
Table 66. Percentage of fisherman familiar with laws/regulations.....	148
Table 67. Main concerns of the fishery sector. Ten selected countries	148
Table 68. Main marketing problems.	149
Table 69. Number of aquaculture facilities in Belize	149
Table 70. Number of aquaculture facilities in Guyana	150
Table 71. Number of aquaculture facilities in Jamaica.....	150
Table 72. Number of Aquaculture facilities in Trinidad and Tobago.....	150
Table 73. Average of years of the farms/facilities	150
Table 74. Main sources of financing.....	151
Table 75. Number of facilities per type of facility.....	152
Table 76. Type of installation	153
Table 77. Annual production (in metric tonnes) per specie.....	155
Table 78. Annual value of the production from aquaculture industry.	156

Table 79. Percentage of aquaculture facilities in each country that carries out other activities.	156
Table 80. Daily incomes (USD).....	157
Table 81. Daily cost (USD)	159
Table 82. Destination of the production	159
Table 83. Characteristics of Full-time employees by type and gender.....	161
Table 84. Importance of the following obstacles/problems in terms of keeping the business running	163
Table 85. Importance of development actions	164
Table 86. Percentage of processing plants in each country that carries out other activities..	165
Table 87. importance of the following obstacles/problems in terms of keeping the business running	168
Table 88. Importance of development actions	169
Table 89. Characteristics of full-time workers in the processing industry in the Bahamas...	170
Table 90. Characteristics of part-time workers in the processing industry in the Bahamas..	170
Table 91. Characteristics of part-time workers in the processing industry in the Barbados	171
Table 92. Characteristics of full-time workers in the processing industry in the Belize	171
Table 93. Characteristics of full-time workers in the processing industry in Grenada.....	172
Table 94. Characteristics of part-time workers in the processing industry in Grenada.....	172
Table 95. Characteristics of full-time workers in the processing industry in Guyana.....	173
Table 96. Characteristics of part-time workers in the processing industry in Guyana	173
Table 97. Characteristics of full-time workers in the processing industry in Jamaica	174
Table 98. Characteristics of part-time workers in the processing industry in Jamaica.....	174
Table 99. Characteristics of full-time workers in the processing industry in St Kitts & Nevis	174
Table 100. Characteristics of full-time workers in the processing industry in St Vincent & Grenadines	175
Table 101. Characteristics of part-time workers in the processing industry in St Vincent & Grenadines	175
Table 102. Characteristics of full-time workers in the processing industry in Trinidad & Tobago	176
Table 103. Characteristics of part-time workers in the processing industry in Trinidad & Tobago	176
Table 104. Environment and natural resources based and not based in livelihoods Source: Ireland, C. 2004 and Tragsatec	194
Table 105. Example of stakeholder analysis Source: EuropeAid Cooperation Office.....	199
Table 106. Activity profile. Source: Authors.....	201
Table 107. Daily routine profile Source: Authors	202
Table 108. Access and Control of Resources and Benefits Source: Authors	204
Table 109. Gender needs.....	205
Table 110. Values of indicators Source: Authors	210

Figures

Figure 1. Steps in preparing questionnaires	17
Figure 2. Information system information flow.....	21
Figure 3. Data Entry application screenshot	21
Figure 4. Dendrogram structure.....	34
Figure 5. Caribbean Regional architecture Source: EU Caribbean Regional Initiative Programme	39
Figure 6. CARICOM members map	42

Figure 7. CARICOM full members map Source: Caribbean Community Climate Change Centre.....	43
Figure 8. Dendrogram grouping countries according to their similarities after the cluster study	71
Figure 9. Poor population in fisheries sector in Belize.....	75
Figure 10. Poor population in fisheries sector in Granada (just interviewees).....	75
Figure 11. Poor population in fisheries sector in Guyana (just interviewees).....	76
Figure 12. Poor population in fisheries sector in Jamaica (just interviewees).....	76
Figure 13. Poor population in fisheries sector in St. Vincent & the Grenadines (just interviewees).....	77
Figure 14. Structure and size of fishing sector population by age groups and sex in Bahamas (just interviewees).....	82
Figure 15. Structure and size of fishing sector population by age groups and sex in Bahamas	83
Figure 16. Household structure of surveyed population in Bahamas	83
Figure 17. Structure and size of fishing sector population by age groups and sex in Barbados (just interviewee)	83
Figure 18. Structure and size of Barbadian fishing sector population by age groups and sex	84
Figure 19. Household structure of surveyed population in Barbados.....	84
Figure 20. Structure and size of fishing sector population by age groups and sex in Belize (just interviewees).....	85
Figure 21. Structure and size of Belizean fishing sector population by age groups and sex	85
Figure 22. Household structure of surveyed population in Belize.....	86
Figure 23. Structure and size of fishing sector population by age groups and sex in Grenada (just interviewees).....	86
Figure 24. Structure and size of Grenadian fishing sector population by age groups and sex	87
Figure 25. Household structure of surveyed population in Grenada	87
Figure 26. Structure and size of fishing sector population by age groups and sex in Guyana (just interviewees).....	88
Figure 27. Structure and size of fishing sector population by age groups and sex in Guyana	88
Figure 28. Household structure of surveyed population in Guyana	89
Figure 29. Structure and size of fishing sector population by age groups and sex in Jamaica (just interviewees).....	89
Figure 30. Structure and size of Jamaican fishing sector population by age groups and sex	90
Figure 31. Household structure of surveyed population in Jamaica.....	90
Figure 32. Structure and size of fishing sector population by age groups and sex in Montserrat (just interviewees).....	91
Figure 33. Structure and size of fishing sector population by age groups and sex in Montserrat	91
Figure 34 Household structure of surveyed population in Montserrat	92
Figure 35. Structure and size of fishing sector population by age groups and sex (just interviewees).....	92
Figure 36. Structure and size of fishing sector population by age groups and sex in Saint Kitts and Nevis	93
Figure 37. Household structure of surveyed population in Saint Kitts & Nevis	93
Figure 38. Structure and size of fishing sector population by age groups and sex in St Vincent and the Grenadines (just interviewees).....	94
Figure 39. Structure and size of fishing sector population by age groups and sex in St. Vincent and the Grenadines	94

Figure 40. Household structure of surveyed population in Saint Vincent and the Grenadines	95
Figure 41. Structure and size of fishing sector population by age groups and sex in Trinidad & Tobago (just interviewees).....	95
Figure 42. Structure and size of fishing sector population by age groups and sex in Trinidad and Tobago.....	96
Figure 43. Household structure of surveyed population in Trinidad & Tobago.....	96
Figure 44. Accessibility to Housing Quality Indicators in The Bahamas.....	101
Figure 45. Accessibility to housing Quality Indicators in Barbados	102
Figure 46. Accessibility to Housing Quality Indicators in Belize	104
Figure 47. Accessibility to Housing Quality indicators in Grenada	105
Figure 48. Accessibility to Housing Quality Indicators in Guyana	106
Figure 49. Accessibility to Housing Quality Indicators in Jamaica.....	108
Figure 50. Accessibility to Housing Quality Indicators in Montserrat.....	109
Figure 51. Accessibility to Housing Quality Indicators in Saint Kitts and Nevis	110
Figure 52. Accessibility to Housing Quality Indicators in Saint Vincent & the Grenadines	112
Figure 53. Accessibility to Housing Quality Indicators in Trinidad & Tobago	113
Figure 54. Home income contributions in fisheries sector households - 10 selected countries	116
Figure 55. Activities in fisheries sector carried out by Fishermen's household members	116
Figure 56. Activities in the fisheries carried out by members of the families of the aquaculture producers interviewed.....	117
Figure 57. Activities in the fisheries carried out by members of the families of the workers in processing sector interviewed	118
Figure 58. Educational level and age distribution of educational level of fishermen interviewed.....	121
Figure 59. Age distribution of educational level in fishermen interviewed (all the countries)	121
Figure 60. Educational level and age distribution of educational level of fishermen's household members	122
Figure 61. Educational level of all fishermen's household members (all countries)	122
Figure 62. Impact of environmental hazards over studied households.....	138
Figure 63. Ways to solve problems after natural disasters	139
Figure 64. Options for changing livelihoods Source: Ireland, C. 2004 (adapted from IMM's approaches to livelihood security.....	193
Figure 65. Diversity of livelihood strategies at Mwandusi Fish Market in Tanga, Tanzania.....	195

Charts

Chart 1. Completed questionnaires by type and sample district in Bahamas	211
Chart 2. Extent of poverty in households of the Bahamian fisheries sector.	211
Chart 3. Main constraints in households of the Bahamian fisheries sector	212
Chart 4. Main constraints by region. The Bahamas.....	212
Chart 5. Bahamian neighbourhoods' main needs	212
Chart 6. Completed questionnaires by sector and sample parish in Barbados	219
Chart 7. Extent of poverty in households of the Barbadian fisheries sector.....	219
Chart 8. Main constraints in Barbadian fisheries sector households	219
Chart 9. Main constraints by parish. Barbados	220
Chart 10. Barbadian neighbourhoods' main needs	220
Chart 11. Completed questionnaires by sector and districts sampled in Belize	228
Chart 12. Extent of poverty in households of the Belizean fisheries sector.	228

Chart 13. Main constraints by district. Belize.....	229
Chart 14. Main needs identified in Belizean neighbourhoods.	229
Chart 15. Completed questionnaires by sector and parish sampled in Grenada.....	238
Chart 16. Extent of poverty in households of the Grenadian fisheries sector.....	238
Chart 17. Main constraints by parish. Grenada.....	239
Chart 18. Grenadian neighbourhoods' main needs.....	239
Chart 19. Completed questionnaires by sector and region sampled in Guyana.....	246
Chart 20. The extent of poverty in Guyana's fisheries sector's households.....	246
Chart 21. Main constraints by region. Guyana	247
Chart 22. Neighbourhoods' main needs in Guyana	247
Chart 23. Completed questionnaires by sector and districts sampled in Jamaica.....	258
Chart 24. Extent of poverty in households of the Jamaican fisheries sector.	258
Chart 25. Main constraints by parish. Jamaica	259
Chart 26. Jamaican neighbourhoods' main needs.....	260
Chart 27. Completed questionnaires by sector and area sampled in Montserrat	270
Chart 28. Extent of poverty in households of the fisheries sector in Montserrat.....	270
Chart 29. Main constraints. Montserrat	270
Chart 30. Main constraints by district. Montserrat	270
Chart 31. Neighbourhoods' main needs. Montserrat	271
Chart 32. Completed questionnaires by sector and districts sampled in St. Kitts and Nevis	275
Chart 33. Extent of poverty in households of the fisheries sector in St. Kitts and Nevis.	275
Chart 34. Main constraints in fisheries sector's households from St. Kitts and Nevis.....	275
Chart 35. Main constraints by district. St. Kitts and Nevis.....	276
Chart 36. St. Kitts and Nevis neighbourhoods' main needs	276
Chart 37. Completed questionnaires by sector and districts sampled in St. Vincent and the Grenadines	285
Chart 38. Extent of poverty in households of the fisheries sector of St. Vincent and the Grenadines.	285
Chart 39. Main constraints by district. St. Vincent and the Grenadines	286
Chart 40. Saint Vincent and the Grenadines neighbourhoods' main needs.....	286
Chart 41. Completed questionnaires by sector and county/parish sampled in Trinidad and Tobago	293
Chart 42. Extent of poverty in households of the fisheries sector. Trinidad and Tobago	293
Chart 43. Main constraints by county/parish. Trinidad and Tobago	294
Chart 44. Main needs of neighbourhoods. Trinidad and Tobago	294

Boxes

Box 1. Expected results of the Diagnostic Study.....	x
Box 2. Main challenges for the development of the fisheries sector in CARICOM countries	xviii
Box 3. Key points for the success of an alternative livelihood activity.....	xxxv

Acronyms and abbreviations

ACP	-	African, Caribbean and Pacific Group of States
ACS	-	Association of Caribbean States
AMF	-	Agricultural Modernization Fund
CAHFSAs	-	Caribbean Agricultural Health and Food Safety Agency
CARDI	-	Caribbean Agricultural Research and Development Institute
CARICOM	-	Caribbean Community
CARIFORUM	-	Caribbean Forum of ACP States
CET	-	Common External Tariff
CDB	-	Caribbean Development Bank
CDF	-	CARICOM Development Fund
CFC	-	Common Fund for Commodity
CFRAMP	-	CARICOM Fisheries Resource Assessment and Management Programme
CIDA	-	Canadian International Development Agency
CIMH	-	Caribbean Institute of Meteorology and Hydrology
COTED	-	Council of Trade and Economic Development
CRFM	-	Caribbean Regional Fisheries Mechanism
CRNM	-	Caribbean Regional Negotiating Machinery
CSME	-	CARICOM Single Market and Economy
DALA	-	Damage and Loss Assessment
EC	-	European Commission
EDF	-	European Development Fund
EPA	-	EU-CARICOM Economic Partnership Agreement
EU	-	European Union
FAO	-	United Nation's Food and Agriculture Organization
FTAA	-	Free Trade Area of the Americas
GDP	-	Gross Domestic Product
GOJ	-	Government of Jamaica
HQI	-	Housing Quality Indicators
IDB	-	Inter-American Development Bank
IFAD	-	International Fund for Agricultural Development
IICA	-	Inter-American Institute for Cooperation on Agriculture
IMF	-	International Monetary Fund
ITC	-	Information and Communication Technologies
LAIA	-	Latin American Integration Association
LDCs	-	Less Developed Countries
MAMR	-	Ministry of Agriculture and Marine Resources
MDCs	-	Medium Developed Countries
MDG	-	Millennium Development Goals
NAHFSAs	-	National Agricultural Health and Food Safety Agencies
NAMDEVCO	-	National Agricultural Marketing and Development Corporation
OAS	-	Organization of American States
OECS	-	Organization of Eastern Caribbean States
OIE	-	World Animal Health Organization
OTN	-	Office of Trade Negotiations
PVS	-	Performance, Vision, Strategy
RTP	-	Regional Transformation Programme for Agriculture
TMACs	-	Technical Management Advisory Committees

UBN	-	Unsatisfied Basic Needs
UK	-	United Kingdom
UN	-	United Nations
UNEP GEF	-	United Nation Environment Program – Global Environment Facility
UNESCO	-	United Nations Educational, Scientific and Cultural Organization
USA	-	United States of America
USDA / APHIS	-	United States Department of Agriculture – Animal and Plant Health Inspection Service
UWI	-	University of the West Indies
WB	-	World Bank
WTO	-	World Trade Organization

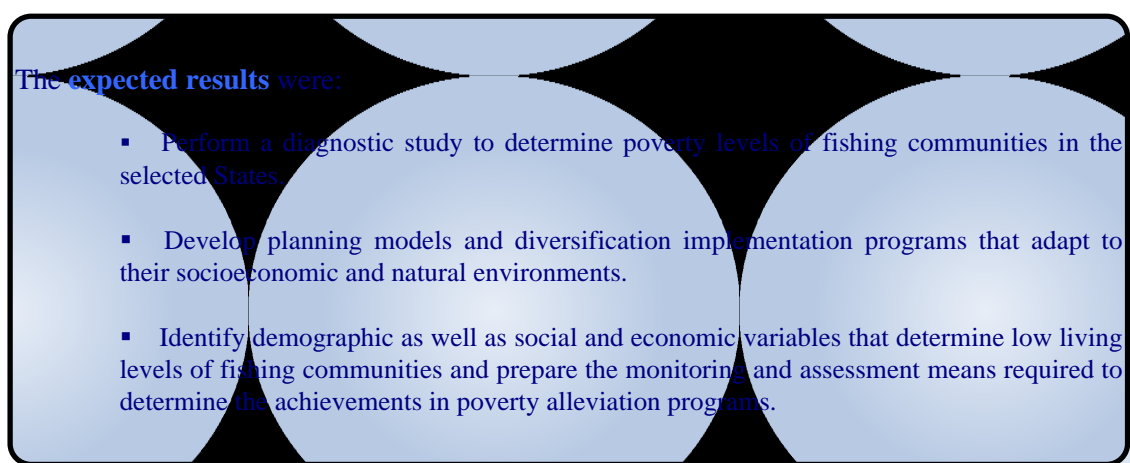
Presentation of the document

The project "Diagnostic Study to Determine Poverty Levels in CARICOM Fishing Communities" is framed in the "Scientific and Technical Cooperation Agreement between the Kingdom of Spain and Caribbean Community", signed in Port of Spain, Trinidad and Tobago, on 4 July 1999.

The **objective** of the project is to determine poverty levels of fishing communities in selected CRFM members States, and its effects on quality of life and structure, so as to identify suitable planning models and implement alternative livelihood and poverty alleviation programs in these communities.

The project was implemented in ten CARICOM Member States. The selected countries had to represent the fishing sector in the region as a whole, as well as reflect the most common problems affecting this sector in the Caribbean.

The direct beneficiaries of this intervention encompass the fishing communities, fishermen, fishing organizations, processors, aquaculture farmers, fishing administrations and other stakeholders.



Box 1: Expected results of the Diagnostic Study

Structure of the report

The findings obtained during the Diagnostic Study to Determine Poverty Levels in CARICOM Fishing Communities are distributed in a two volumes report.

Volume I is the Report itself while Volume II is a Policy Report in which the Study, its main findings and the recommendations are summarised.

Volume I: Draft Report of the Diagnostic Study to Determine Poverty Levels in CARICOM Fishing Communities.

Volume I is organized into five sections and six appendices.

Section I is an introduction to the Study, in which all phases of the project are described, and the methodology used for the study design is explained.

Section II provides background information on the history, geography, demography and socio-economic and political aspects of the CARICOM Region and as such assist in establishing the context within which the Study should be considered.

Section III contains the Main Findings of the Study. In the first chapter of this section, the extent of poverty in the ten selected countries is analyzed, identifying the most sensitive communities and their main constraints. In the following chapters an overview of the analysis of the three sectors studied and their member's livelihoods are provided.

Section IV brings together all the proposed recommendations to reduce poverty in fishing communities.

Section V introduces the topic of the “alternative livelihoods”, putting forward a proposal for a Livelihood assessment programme.

At the end of the report are included the appendices:

Appendix I consists of a profile of each country studied. These profiles list all the main findings of the Study in relation of the ten countries surveyed.

Appendix II is a data mining guide which explains how to extract information from the database, and how to do a multivariable analysis using the program “R”

Appendix III contains three questionnaires used in the survey.

The **Appendices IV and V** contains the list of participants at the two workshops held throughout the implementation of this project.

Appendix VI brings together the four pilot projects for a poverty alleviation program, designed by the teams established during the Validation Workshop.

Volume II: Policy document for the Diagnostic Study to Determine Poverty Levels in CARICOM Fishing Communities.

Volume II is organized into four sections that highlight the key points of the Study.

SCOPE OF THE STUDY is an introduction to the Study, in which all phases of the project and the methodology used for the study design are summarized.

MAIN FINDINGS OF THE STUDY contains an overview of the poverty levels in fishing communities in selected CARICOM States; an overview of the demographic and socio-economic variables underlying low standards of living and the main findings of the analysis of the three sectors studied.

RECOMMENDATIONS bring together the proposed recommendations to reduce poverty in fishing communities.

PLANNING AND IMPLEMENTING ALTERNATIVE LIVELIHOOD PROGRAMMES SUITED TO THE SOCIO-ECONOMIC AND NATURAL ENVIRONMENTS introduces the topic of the “alternative livelihoods”, putting forward a proposal for a Livelihood assessment programme.

Acknowledgements

Due to the wide scope of this project the close collaboration of the CARICOM Secretariat and the CFRM Secretariat, especially in the development of some specific activities, has been fundamental to its success.

Also the active involvement of the concerned fisheries administrations of the countries in which the Study was conducted has been key to the success of the project.

EXECUTIVE SUMMARY

I. THE STUDY: METHODOLOGICAL APPROACH

1. Introduction

Poverty remains one of the severest blights of humankind. Worldwide, more than one billion people continue to live in extreme poverty in spite of all the efforts by international and national donor agencies, governments and individuals over many decades. Poor rural people, and those who are vulnerable to slipping (back) into poverty, have been hit especially hard by the recent global financial crisis and the continuous increase in food prices that has been happening since 2007. Poor and vulnerable people are also among the first to be affected by the impacts of climate change.

The dimensions of poverty cover different aspects of human capacity: economic (income, livelihoods, decent work), human (health literacy), political (power, rights, voice), socio-cultural (status, dignity) and protection (insecurity, risk, vulnerability).

2. Methodology

2.1 Country Selection

The study was designed to analyse the situation of ten of the fifteen CARICOM Member States, and thus be able to extrapolate the results to the whole Community. The selected countries had to be representative of the entire fishery sector in the region, and reflect the most frequent problems related to this sector in the Caribbean.

The criteria for selection of the ten member states was determined using several **socioeconomic variables** for the classification of the countries within an economic context; and several variables **related to fisheries sector**, in order to be able to justify the relationship between the different countries and the fisheries sector.

A marking system was elaborated to assess the importance of each variable in each country. This marking system gives priority to those countries in which variables were scored with high and low marks.

The selected countries were Trinidad and Tobago, Barbados, Saint Vincent and the Grenadines, Montserrat, Saint Kitts and Nevis, Guyana, Grenada, Jamaica, Belize and The Bahamas.

2.2 The Survey

The selected method for data collection was the direct personal collection by means of a survey taker. To obtain the labour and household conditions' data of the members of the three sectors participating in this study: the extractive fishing, aquaculture and processing of fishery products sector, three different types of surveys were designed.

Sampling is a tool with which the desired information can be obtained without incurring unnecessary costs in resources while at the same time minimising errors. For the generation of "good" statistics which enable appropriate conclusions to be drawn, it is important to:

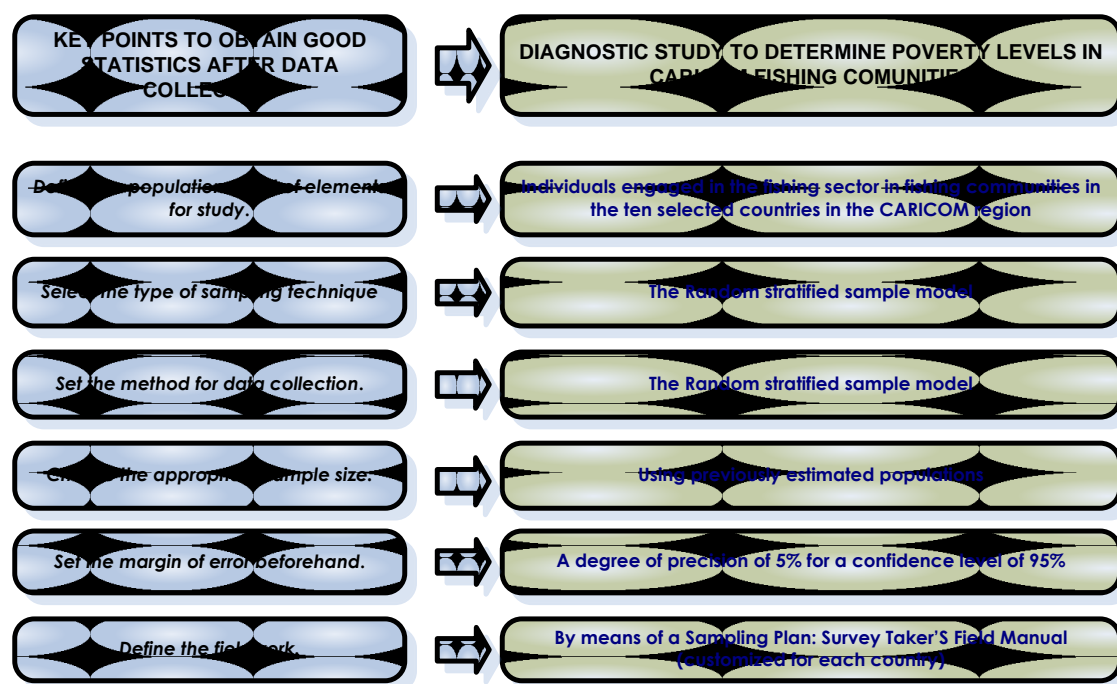


Chart 1: Key points to obtain good statistics after data collection

2.3 The Analysis

Information obtained from the questionnaires was stored in a centralized database. Before analysing the data, must be processed and edited to mitigate or correct detectable errors. During this phase of processing and editing some problems were detected as high rates of non-responses, especially in economic questions; biased data, normally produced by misunderstanding of the question; errors in species coding and use of different units than specified in the questionnaire.

Descriptive statistics, fishing activity and poverty indicators and multivariate analysis are the methodology used for data analysis

A. Descriptive statistics: Unsatisfied Basic Needs (UNB) Index

- √ allows considering poverty as a multidimensional phenomenon;
- √ allows to measure the actual achieved standards of living in the CARICOM Region, from the lowest to the highest levels; and
- √ allows to define deprivation (meaning human poverty) as the lack of satisfaction of basic needs.

Four components with their variables have been considered as the most important factors of the UNB index:

Components / Basic Needs	Dimensions	Variables
Dwelling Quality Minimum level of habitability that a dwelling should have.	Construction Materials	Exterior wall construction materials
		Floor construction materials
		Roof construction materials
	Overcrowding	Nº of rooms and household members
Access to services Measures the level of health conditions of the dwelling.	Running water service	Running water availability (at home, inside or outside the community)
	Excreta removal service	Toilet availability (at home, inside or outside the community)
Education Minimum requirement for people to integrate adequately into productive and social life. Along with family, school is the most important socializing agent.	Children's schooling	Household member between 5 and 15 years attending school
Economic capacity Component directly related to household incomes. In this case it has been used a direct method by asking the interviewee directly about Household incomes and costs.	Household income	Total income from all household members

Table i: Basic needs, dimensions and variables

This method classifies the households participating in the Study into the categories of **poor (more than one Unsatisfied Basic Need)**, **vulnerable (one Unsatisfied Basic Need)** or **non-poor (no unsatisfied basic needs) households** depending on its degree of satisfaction of the four basic needs defined.

B. Indicators selection

Fishing activity and poverty indicators were used to identify the demographic and socio-economic variables underlying low standards of living.

Within the fishing activity indicators some technical, economic, market and social indicators were defined. Technical indicators were used for the assessment of the vessels and crew physical productivity and the economic, social and market ones were used for the assessment of the vessels and crew economic productivity.

The poverty indicators were used to assess the importance of fishing within the household economy and the degree of economic dependency (the number of people per household dependent on one source of income).

C. Multivariate study

As the name indicates, multivariate analysis comprises a set of techniques dedicated to the analysis of data sets with more than one variable. For this study cluster analysis has been selected to show the relationship between countries and fishing communities based on their common characteristics. Dendrogram is a product of cluster analysis and it reflects the results

of the cluster analysis in a tree diagram from which hangs clusters/groups of countries with similarities in the variables studied.

II. INTRODUCTION TO CARICOM REGION

3. General context

Caribbean regional architecture is comprised of at least four layers, with the Organisation of Eastern Caribbean States (OECS) having reached the highest level of integration; the Caribbean Community, or CARICOM, which is still advancing towards higher levels of policy and functional cooperation with the establishment of the CSME; the CARIFORUM including all the Caribbean ACPs and Cuba; and the Association of Caribbean States (ACS) including all States in the Caribbean.

Small Island Developing States (SIDS) are small islands and low-lying coastal countries that share similar sustainable development challenges. All countries (except Montserrat) selected for this study are included in the list of SIDS countries.

4. Fishery Sector

The fisheries sector is critical for the Caribbean region since, inter alia, it provides employment for many rural communities, as well as enhancing food security and export earnings.

The nature of the fisheries of the region is varied. It ranges from the shrimp and ground fish stocks off Guyana and Suriname to the pelagic stocks off Trinidad and Tobago. The Region also contains the reef species of the Eastern Caribbean, and the conch and lobster stocks of Jamaica, The Bahamas and Belize. The migratory pelagic such as wahoo, tuna, flying fish and dolphin fish typically roam through the area (CRFM 2004)¹.

CRFM (2004) reports that the structure of the fishing industry in the CARICOM region is characterised by:

- a large artisanal fisheries sector, where the majority of fisherfolk operate on a small scale basis concentrating on mostly primary production, utilising small boats and limited technology which is comprised of traps, cast nets and hook and line;
- an industrial fleet sector of large, modern, capital-intensive vessels which operate mainly in offshore areas, largely targeting high priced and valued added species. Targeted species include spiny lobsters (Jamaica and the Bahamas), conch (Jamaica, the Bahamas and Belize), shrimp and prawns (Guyana Suriname and Trinidad and Tobago), tuna (wider Caribbean) and flying fish (Eastern Caribbean);
- a processing, distribution and marketing sector; and
- an un-quantified, recreational fisheries sub-sector spanning various aspects of tourism, including domestic and international sports fishing tournaments, yachting, fishing, weekend group and family fishing events.

¹ CRFM. A Common Fisheries Regime for the Sea. July 2004.

Inland capture fishery activities are limited to the larger countries such as Guyana, Jamaica and Belize.

Culture fisheries are at varying stages of development in the region. However, inland culture fisheries are more established in the larger territories, such as Jamaica and Belize where the dominant species are red tilapia and shrimp, respectively. Guyana is currently seeking to establish a commercial aquaculture subsector. Less developed food fish culture exists in Saint Lucia (sea moss) and Trinidad and Tobago (tilapia).

Main challenges for the development of the fishery sector in CARICOM countries

- **The need for information systems:** within the CRFM countries current information systems are limited in scope, for the most part being focused on the collection and dissemination of catch and effort data
- **Fishermen organization and co-management:** governments have been promoting co-management with fishermen's organizations as a strategy for effective fisheries management. It is envisaged that co-management will result in increased stewardship as well as greater responsibility and authority among the fishermen.
- **The IUU fishing:** the scope of the IUU fishing problem in the region encompasses fishing and related activities by nationals and foreign fishers in waters under national jurisdiction and on the adjacent High Seas.
- **The problem of hurricanes:** hurricanes can cause significant impacts, especially on small islands where vulnerability is accentuated by their smallness.
- **An underdeveloped Aquaculture/mariculture sector;** with a significant aquaculture development only in Jamaica and Belize.

Box 2. Main challenges for the development of the fisheries sector in CARICOM countries

III. MAIN FINDINGS OF THE STUDY

5. The Nature of Poverty in Fishing Communities of the CARICOM Region: Quantitative and qualitative analysis

This study has examined poverty in fishing communities of the Caribbean Community from a Quantitative and a Qualitative point of view.

The Quantitative analysis, by means of the Unsatisfied basic needs index and the fishing activity and poverty indicators, “quantifies” the importance of poverty in fishing communities’ households; while the Qualitative analysis identifies: the countries with the highest percentage of poor households; the importance of poor, vulnerable and no-poor homes within each sector; and the most sensitive communities of each country and its main constraint.

Table ii shows the importance of non-poor, vulnerable and poor households in each country studied.

Country	Non-Poor	Vulnerable	Poor	Total general
BAHAMAS	94.39%	5.61%		100%
BARBADOS	92.63%	7.37%		100%
MONTSERRAT	92.50%	7.50%		100%
SAINT KITTS AND NEVIS	90.14%	9.86%		100%
SAINT VINCENT AND THE GRENADINES	83.78%	10.81%	5.41%	100%
TRINIDAD AND TOBAGO	83.44%	15.23%	1.32%	100%
GRENADA	67.77%	25.62%	6.61%	100%
JAMAICA	61.15%	27.39%	11.46%	100%
BELIZE	54.70%	19.66%	25.64%	100%
GUYANA	50.30%	25.45%	24.24%	100%
Average selected countries	70.47%	19.76%	9.77%	100%

Table ii: Poverty distribution over the 10 selected countries

As can be observed, in this Study:

- √ No household from **Bahamas, Barbados, Montserrat** and **St. Kitts and Nevis** was considered to be poor.
- √ **Belize** and **Guyana**, followed by **Grenada** and **Jamaica**, were found to be the countries with the highest percentage of poor and vulnerable households. They were also found to be the countries in which households have more trouble in getting their basic needs met.

In general terms, in the three types of sectors studied, the percentage of non-poor households is above the 75% with the exception of **Belize, Guyana, Jamaica, and Grenada**.

- √ **Extractive fishing** is the sector, of the three sectors studied, most affected by the presence of vulnerable and poor households.
- √ According to the results of the study, there are no poor households in the **processing sector**.

- ✓ Poor households in the **aquaculture sector** were only found in **Belize** and **Guyana** and in a very small proportion in Jamaica; and vulnerable homes were only found in Barbados, Belize, Guyana, Jamaica and Trinidad and Tobago.

Table iii shows the unsatisfied needs found in households of each country and the districts, parishes or regions affected. **The constraints detected are marked with a tick and those that are more serious are also shaded in yellow.**

Country	Dwelling quality	Access to services	Education	Economic capacity	District/parish/regions more affected
BAHAMAS		✓	✓	✓	Abaco; Central Andros; North Andros
BARBADOS	✓	✓	✓	✓	Saint Joseph; Saint George; Saint Michael; Saint James; Saint Lucy
MONTERRAT		✓		✓	Carr's/Little Bay
SAINT KITTS AND NEVIS		✓	✓	✓	St. George, St. James; St. Pauls; St. Thomas; St. Anne's
SAINT VINCENT AND THE GRENADINES	✓	✓	✓	✓	Barrouallie; Fitz Hughes; Owia; Great Head Bay; Kingstown; Layou; Union Island
TRINIDAD AND TOBAGO	✓	✓	✓	✓	Caroni, St. David, St. David / South West; St. George; St. Mary / North East; St. Patrick; St. David / North East, St. Andrews / South West; St. Patrick / South West; Victoria; Mayaro
GRENADA	✓	✓	✓	✓	Petite Martinique, St John's, St. Mark's; St. Andrew's, St. Patrick's; Carriacou; St. George's;
JAMAICA	✓	✓	✓	✓	Clarendon; Hanover; Kingston: Manchester; Portland; Saint Andrew; Saint Ann; Saint Catherine; Saint Elizabeth; Saint James; Saint Mary; Saint Thomas; Trelawny; Westmoreland
BELIZE	✓	✓	✓	✓	Belize City; Cayo; Corozal; Stann Creek; Orange Walk; Toledo
GUYANA	✓	✓	✓	✓	Region # 2; Region # 3; Region # 4; Region # 5; Region # 6

Table iii: Main constraints detected in each country and districts / parishes / regions affected by these limitations

NOTE: For further information about the characteristics of poverty in each country, please check Appendix 1 of the Technical Document: Diagnostic Study to Determine Poverty Levels in CARICOM Fishing Communities

Demographic characteristics; physical living conditions; and perception of the economic situation of poor households

DEMOGRAPHIC CHARACTERISTICS	PHYSICAL LIVING CONDITIONS	ECONOMIC SITUATION
<p>Compared to non-poor and vulnerable households, poor households tend to have:</p> <ul style="list-style-type: none"> ✓ a higher average of members living in a household (Average: 5.9 members per household) ✓ Higher importance of overcrowding. (Average: 2.96 members per room) ✓ Higher percentage of young people (school age) ✓ Higher percentage of illiteracy (though in the study it is considered a low percentage of illiteracy) 	<p>Compared to non-poor and vulnerable households, poor households tend to have:</p> <ul style="list-style-type: none"> ✓ Use of low quality materials for dwelling construction. It has only been observed in some poor and vulnerable households from Belize, Guyana and Jamaica. (The percentage of homes build with low quality materials in each of these countries is inferior to 5.5%) ✓ In general terms, vulnerable and poor households have more difficulties in accessing services. Jamaica is the country in which households have more problems in accessing more than two services. 	<p>Compared to non-poor and vulnerable households, poor households tend to have:</p> <ul style="list-style-type: none"> ✓ A Low economic capacity: a high average of members per households may cause that incomes will not be able to sustain all the needs of household members. ✓ A high degree of economic dependency caused by the high proportion of school-aged members. Household members with a job have to financially support a greater number of unemployed household members. ✓ A high importance of fishing within families Index: Poor households do not tend to receive economic contributions from other sectors.

Table iv: Characteristics of poor households

6. Description of the social and economic status in Fishing Communities of the CARICOM region

Living conditions

Three Living Standards that would define the quality of households were identified during the analysis of the surveys' results.

Housing quality indicators (HQI) are some specific indicators that would define the household's degree of accessibility to some services.

Overcrowding defines the number of persons sharing a room. It defines the degree of privacy of household members.

The ownership of durable goods assesses the household's degree of ownership of material possessions, whether they are a desirable possession whether they are not. Motor vehicles and washing machines, followed by refrigerators are the principal material possessions that households cannot afford.

Table v describes in general terms the quality of households for each country.

Country	HOUSING QUALITY INDICATORS				OWNERSHIP OF DURABLE GOODS		
	Optimum access. Less than 5% of households have to resort to their community to have access to more than 1 resource	Between 5 and 10% of households have to resort to their community to have access to more than 1 resource	More than 10% of households have to resort to their community to have access to more than 1 resource	High percentage of DK/NA (difficult the assessment)	<=2 goods are not affordable by more than 10% of interviewees	3 goods are not affordable by more than 10% of interviewees	4 goods are not affordable by more than 10% of interviewees
BAHAMAS	√				√		
BARBADOS	√				√		
MONTSERRAT	√						√
SAINT KITTS AND NEVIS	√				√		
SAINT VINCENT AND THE GRENADINES	√					√	
TRINIDAD AND TOBAGO	√				√		
GRENADA		√		√		√	
JAMAICA			√	√		√	
BELIZE		√		√		√	
GUYANA				√		√	

Table v: Households Quality by country

Investment in community-oriented infrastructure should be given a priority. Asphaltting, drainage network and more health centres are what member from fishing communities consider as major needs.

Labour market issues

In terms of numbers, the Jamaican fisheries sector contributes to the largest number of persons that benefit from the fisheries sector in terms of employment, followed by Guyana, Trinidad and Tobago, Barbados and Saint Vincent and the Grenadines. The fisheries sector in Montserrat and Saint Kitts and Nevis have the lowest levels of employment.

Credits and savings

In the countries selected for this study there is a high percentage of households with relatively easy access to loans. Nevertheless, **only an average of 27% of households has ever received loans and only in 7% of the cases the money received was considered enough.**

Education and skills

Based on this study, half of the fishermen interviewed had received basic or primary education and almost 40% of remaining respondents had received some secondary education. It was also observed that 3.8% of fishermen attended tertiary education courses. **Illiteracy and semi-literacy affects 4.3% of the population studied and cannot be confined to a particular age class.**

Governments and NGOs have developed training and educational programmes to encourage responsible fishing practices, promote the sustainability of resources and maintain product quality. Despite all of this, the survey reveals a not particularly high percentage of training among fisher-folk. Given the results, **it is noteworthy that as a mean value, only 17.61% of respondents in all countries of the study had received any kind of training in the last five years.**

Risk and on-board safety, and fishing techniques were the main types of training provided in all countries.

Health

Health Policies rest on the tenet that health care is a fundamental right of every citizen. Montserrat (30%), Guyana (18.5%), Barbados (15%), Jamaica (14.9%) and Trinidad and Tobago (13%) are the countries with the highest level of workers with any kind of illness or disability.

Social benefits: social security system and subsidies

A low involvement of fisheries sector's workers in the social security system has been observed. More than half the fisher-folk and members of the aquaculture sector interviewed were not participants in a social security system and **only in the processing sector was there a significant proportion of interviewees benefiting from it.**

Several CARICOM Member and Associate Member States provide direct and indirect **subsidies** to their fisheries sectors. These are administered in the form of incentives aimed at stimulating growth and development of fisheries and aquaculture, primarily by reducing input costs.

Grenada appears to be the country with the highest percentage of fishermen benefiting from a subsidy in the last five years (42% of respondents). Less than 8% of fishermen from St. Vincent and the Grenadines, Jamaica, Guyana, Belize and Bahamas claimed to have received any form of subsidy.

Fleet productivity

Guyana has the least economically productive fleet in terms of catch per vessel. The negligible selling price that the fishery products reach in the market is their main weak point.

Fleets from Montserrat, Jamaica, Belize and Saint Kitts and Nevis, also have a low economic productivity, due to the low fishing capacity of their vessels and in some cases also due to the low selling prices.

With the exception of fishermen from Barbados, Belize, Guyana, St. Vincent and the Grenadines and Trinidad and Tobago, a significant interest in investing in fleet modernization has been observed in all countries. More than 78% of respondents in each country claimed that they will invest in the next 5 years in improving their fishing activities. Buying new gears, boats, engines and equipment are the main objectives of fishermen.

In Barbados, Belize, Guyana, St. Vincent and the Grenadines and Trinidad and Tobago, between 40% and 62% of fishermen claim that they will invest in the next 5 years in improving their fisheries activities.

Impact on the economy

The fisheries sector is a major contributor to income, employment, food security and social and economic stability, especially in coastal communities throughout the Caribbean. Small-scale fisheries contribute to household economies and are sometimes the only source of income. They also contribute to local economies, not only with the direct impacts of fisheries products' sales, but also with indirect impacts "upstream" and "downstream" of the production activity that occurs through the commodity/supply chain. Small-scale fisheries also contribute to the economic growth at a national level with their contribution to the Gross Domestic Product; generating foreign exchange derived from international trade; and generating a wide range of taxes.

Another important contributor to the fisheries sector's economy is the recreational fisheries subsector, spanning various aspects of tourism, including domestic and international sports fishing tournaments, yachting, fishing, weekend group and family fishing events.

Impact of the environment: Environmental issues and Natural hazards

With the exception of some fishermen in Grenada, Montserrat and St. Vincent and the Grenadines, CARICOM region fishermen are aware of the necessity of preserving the resources, with most of them having observed a reduction in catches and fish sizes in the recent years. Fishermen are also aware of the importance of marine protected areas and think that they have a positive impact on fishing.

37.19% of households surveyed claim to have been adversely affected by an environmental hazard, with Montserrat, Jamaica, Guyana, St. Vincent and the Grenadines, Belize and Grenada being the countries most affected.

Hurricanes and floods appear to be the major environmental hazards which households have to face in Caribbean region. In Montserrat volcanic activity even removes the spotlight over hurricanes, as 63.41% of Montserrat interviewees declared to have suffered the effects of volcanic activity over their homes in the last five years. Main constraints of Guyana household's are floods and the climate phenomenon "El Niño".

The role of women

In the three sectors studied, a low participation of women workers has been observed, especially in the processing sector, where a large participation of women would usually be expected due to their skills that are normally well suited to those required for that sector.

Fisheries co-management

The cooperative type of co-management is where government and users cooperate together as equal partners in decision-making and this type of co-management is seen as the "real" type of co-management.

The study shows that fishermen from all selected countries (with the exception of Belize and Jamaica) do not feel that they are involved in the decision making processes as they are not consulted (neither as individuals nor through associations) by the fisheries administration. Furthermore, they show a low-medium level knowledge concerning the existence of fishery policies, strategies and management plans (with the exception, again, of Belize and Jamaica). By contrast, an average of almost 80% of the interviewees is familiar with the laws and regulations that govern the fishing sector in their countries.

Main concerns

The main concerns of fishermen are related to problems regarding infrastructure for unloading and in meeting their supply and maintenance needs. In terms of issues related to marketing, their main constraints appear to be the lack of adequate markets and the low price of fish.

7. Status of the aquaculture sector

In general terms, aquaculture is an emerging sector in the CARICOM region, in which most facilities operate at a small or subsistence scale, not using its full production capacity. The industry appears to be financed mainly by personal savings and an intention to continue investing in enlarging the facilities, constructing new ponds and buying fingerlings was observed in almost all farms studied.

The use of production is almost entirely limited to human consumption, except for Belize, where part of the production is intended for restocking (15.38%), Guyana (17.39%) and Jamaica (1.69%). Furthermore, in Jamaica some facilities produce ornamental fish.

Aquaculture products are mainly sold in the local and national market but a small percentage of exports at the regional level also exist; only Guyana and Jamaica export aquaculture products at an international level (in Guyana, more than 40% of the total aquaculture production).

The industry employs more full-time workers than part-time, in both cases most of the employers are men. Almost all jobs have the status of semi-skilled or unskilled, regardless of sex. Seasonal staff occupies fewer skilled positions. More than half of the members of the aquaculture sector interviewed were not participating in the social security system.

A high percentage of companies do not have any insurance contract, nor receive any type of subsidy by the government (except for Guyana, where 22% of companies had received it) or have not received any non-governmental assistance in the last five years. For the most part farms do not have government concessions regarding access and land tenure.

With the exception of Saint Kitts and Nevis (no respondent stated that he/she belonged to any cooperative or association), the cooperatives seem to be present in all countries but very few companies claim to be part of any. The survey results indicated that only aquaculture facilities in Belize and Jamaica fully supported the work of associations and cooperatives.

On average more than 88% of all businesses of the aquaculture industry do not carry out any wastewater treatment and more than 50% are not re-circulating water. Only Guyana and Jamaica report high percentages of facilities (50 and 71% respectively) using filters.

The main problems highlighted by the interviewees related to the management of a farm were, among other issues, the bureaucracy, difficulties in gaining access to markets, electricity and problems with supplies.

The strategic actions requested by interviewees were, among other issues, the training of specialized technicians, improvements in health control and product quality and the promotion of producers' organizations and market opportunities for aquaculture products.

8. Status of the processing sector

The processing industry has been operating in the countries of CARICOM for more than sixteen years. With exceptions, most processing plants do not operate at full capacity. On average, plants are operating at 30% of capacity, and most of them do not have the capacity to supply their products throughout the whole year.

The processing industry appears to be financed mainly by domestic bank credit and personal savings and most of the companies surveyed intended to continue working in the future and continue investing in the modernization of the company. However, some companies in Belize (33%), Grenada (3%), Guyana (25%), Jamaica (20%) and Barbados (14%) have indicated the intention to cease production in coming years.

Employment in the fish processing industry is affected by the closed periods of some fish species, migration, etc., with lay-offs during closed seasons and the hiring of extra staff during peak catch periods. In Belize, Jamaica and Saint Kitts and Nevis processing companies had a 100 per cent participation rate in a social security system. In the rest of the countries membership in a social security system ranged between 56 and 85 per cent, except in Barbados, where the participation rate was less than 50 per cent of businesses.

In general, almost all companies of all countries provide training courses to their workers, especially in the Bahamas, Grenada, Jamaica and St. Vincent and the Grenadines. The main courses are related to the handling of food and machinery and Hazard Analysis and Critical Control Points (HACCP).

In general processing companies do not have any insurance contract, nor receive any type of subsidy by the government or have not received any non-governmental assistance.

With the exception of St. Vincent and the Grenadines, the cooperatives seem to be present in all countries but very few companies claim to be part of any.

With a few exceptions, there has not been observed a high involvement in wastewater treatment neither in the solid waste generated during processing activity. On average more than fifty-three percent of all businesses of the processing industry did not undertake wastewater treatment of any kind, and forty-five percent of them threw the generated solid waste on a garbage dump, or into the river or the sea. The hygiene and sanitary controls of raw materials are fully implemented in countries like the Bahamas, Belize and Jamaica.

The main problems highlighted by the interviewees related to the management of a processing plant were, among other issues, difficulties in finding specialized staff and in waste water treatment.

The strategic actions requested by interviewees were, among other issues, speeding up administrative procedures, training of specialized technicians, improvement in technology transfer, improvements in health control and product quality, promotion and investment in the processing industry, promotion of the consumption of processed products; promotion of market and opportunities, promotion of producers' organizations and the design and implementation of action plans.

IV. RECOMMENDATIONS:TOWARDS POVERTY REDUCTION IN FISHING COMMUNITIES

Poor people tend to be the most dependent upon the environment and the direct and indirect use of natural resources, such as the coast, and therefore are the most severely affected when the environment is degraded or their access to natural resources is limited or denied. Not only are their economic activities linked to these access issues, but their ability to engage in economic activities can be affected by poor environmental quality and the resulting impact on their health.

The following is a summary of the recommendations contained in the Technical Document: “Diagnostic Study to Determine Poverty Levels in CARICOM Fishing Communities”.

Recommendations related to the improvement of policy processes

- √ Carefully identify all small-scale fisheries stakeholders that need to be involved in policy formation and ensure their participation.
- √ Work with small-scale fisheries organizations to strengthen the ability of their representatives to participate meaningfully in the process and make specific use of the knowledge and experience of small-scale fishers and fish workers;
- √ Conduct regular reviews and analysis of policies (to assess their impacts on small-scale fisheries), and of policy processes (to assess the extent to which small-scale fisheries interests are being included); and
- √ Consider how fisheries policy development can be linked to the specification of national poverty reduction strategies and Poverty Reduction Strategy Papers (PRSPs).

Recommendations related to social issues

- √ Encourage the participation in a Social Security System. A Fishermen's Pension and Social Security Benefit Scheme should be established within a legal framework.
- √ Develop and introduce a financial support plan (should include micro-finance schemes), in strong collaboration with related financial agencies and governments, to provide fisher folk and fisher's organizations with access to credit for investment in responsible fishing gear and technologies, safety gear and safer practices.

Recommendations related to education and skills

- √ Improve the sector's training by implementing a training program aimed, firstly, at trainers in the field of administration (planning and management issues), professionals/graduates (in Oceanography, Biology, Marine Ecology and Aquaculture), fishermen's associations (in practice of navigation, fishing, use of technology, safety on board vessels, handling and safety of fishery products, associations, self-management) and business associations (in handling and hygiene, management, accounting).

- ✓ Heighten the sector awareness on relevant issues that directly affect its activity, such as resource conservation, the need for team management, participation in decision-making process, etc. This awareness can be accomplished by holding workshops and, if appropriate, by distributing leaflets or other graphic materials adapted to suit varying levels of literacy.

Recommendations related to impact on the economy

- ✓ Improve the fishery products market structure. Amongst others, docks, markets, refrigerated storage and processing areas all need building or renovating.
- ✓ Reinforce marketers' organizational structure. Agents should be registered and use well-defined channels.
- ✓ Improve inland distribution. Strengthen basic infrastructures such as roads.
- ✓ Invest in measures designed to reduce post-capture loss.
- ✓ Ensure a regular supply of fish to facilitate the organization of the market.
- ✓ To facilitate exports and create a favourable climate for private investments.
- ✓ Conduct a market analysis that would provide information on use of the resource and the marketing and new market opportunities.

Recommendations to the improvement of fisheries management

The administration in charge of managing fisheries should aim:

- ✓ To monitor fishing effort and enforce fishing regulations (MCS);
- ✓ to monitor fish stocks and advise on appropriate levels of exploitation of major commercial stocks;
- ✓ to report on the volume and value of production in the sector; and
- ✓ to inform and instruct fishers on new technology through extension services.

Recommendations to the improvement of fisheries co-management

- ✓ Develop a resource management and community development plan whose objectives and strategies include a co-management agreement.

Recommendations to women empowerment in fisheries

- ✓ Introduce policies and programs that meet the needs of women in the fisheries sector, recognise and value the role they play and empower them at all decision-making levels — from the household to government.

Recommendations related to vulnerability to natural hazards.

- ✓ Expand innovative partnerships and networks to meet critical needs.
- ✓ Enhance regional cooperation.
- ✓ Standardize and harmonize risk management methodologies and practices.
- ✓ Undertake baseline studies to identify strengths and weaknesses of disaster reduction programs.
- ✓ Document best practices and lessons learned.
- ✓ Implement an insurance plan to protect fisher folk's income and compensate for injury and property loss.

Recommendations related to the protection of the environment

- ✓ Introduce good environmental practices.
- ✓ Create more Marine Protected Areas.

Recommendations related to the aquaculture sector.

- ✓ Make a study to determine the aquaculture potential of the different States that would provide conclusions that will support decisions on how to develop the sector in the various Departments in the country, both inland and on the coast.
- ✓ Some of the opportunities to be analysed are options for managing aquaculture integrated with irrigation, farming of continental species tanks at different scales and intensities and farming in tanks or enclosures in salt or sea water. The selection of species with the best market perspectives or highest commercial value, the use of foreign species for farming or the farming of non-food species are other aspects to be studied.
- ✓ An information system could be designed and implemented, to include basic data on the sector such as the number of facilities / units of cultivation, active or inactive condition, geographical location, water use, cropping patterns, crop species and their production, human resources involved, availability of agricultural products for inputs, closest rural and urban centre of population, markets, etc. This system may take the form of Geographic Information System (GIS).
- ✓ The establishment of a network will contribute to the improvement in the planning of the activity and the effective exchange of information between different agents.
- ✓ All information collected should be used for the preparation of Action Plans (national and regional) for the development of aquaculture, which should provide confidence to invest.

- √ In order to enhance the productive capacities, carry out projects to improve the production conditions of the growth units which are in operation by improving the management of infrastructure, the acquisition of fishing equipment, building structures for fish manipulation and storage, etc. They should also assess the technological needs of energy supply and technology for the cultivation among others, and boost their acquisition, operation and maintenance.

- √ On the other hand, a pilot culture project on a commercial scale could be launched, taking into account the results of small-scale projects that are being developed to propose the location and cultural practices which are more appropriate to the situation of each country.

V. PLANNING AND IMPLEMENTING ALTERNATIVE LIVELIHOOD PROGRAMMES SUITED TO THE SOCIO-ECONOMIC AND NATURAL ENVIRONMENTS

The need for sustainable livelihoods for fishing communities is critical. Population growth rate continues to increase, while marine resource stocks continue to dwindle. Alternative livelihoods are seen as essential for both the development of fishing communities and for the conservation of marine and coastal biodiversity and ecosystems.

The goal of alternative livelihoods is not simply to come up with an alternative activity that theoretically provides choice and hopefully promotes sustainability as much of the current work in this area seems to do. Rather the goal is to find solutions that fit with people's current livelihood strategies and that will have positive impact on their livelihoods and the use of natural resources.

Alternative livelihoods are not a short cut to quick development and conservation wins. Rather it is an intervention that requires a thorough understanding of the livelihoods of the community. Interventions to support livelihoods should take place over a spectrum and be relevant to people's needs and aspirations.

Proposal for Livelihoods Assessment

The objective of the **fishing livelihoods assessment** is to demonstrate the feasibility of building up a more comprehensive understanding of fishing livelihoods and the context in which fishing communities are currently surviving in order to identify appropriate entry points for supporting the achievement of sustainable livelihoods.

The proposed framework (should be adapted to the local context in which it is being applied) is as follows:

- **Phase 1: Identify fishing community and contacts within the community.**
- **Phase 2: Collect secondary data on the environment, previous socio-economic and household studies and other research/literature to build up a background to the area.** Emerging macro-economic issues identified from literature.
- In addition to the literature review, household interviews can be considered as an effective method to collect data. Household interviews are a method of making detailed examination of the way that a household thrives and survives.
- **Phase 3: Undertake a stakeholder analysis to build up an understanding of who is involved with, has an influence over or has an interest in the identified coastal community.** Through using a selection of analytical tools build an understanding of the different assets, skills, capacities, needs and aspirations of the community. Identify vulnerabilities and external influences (policies, institutions, organisations and processes) that affect the community.
 - Identify the activities performed by men and women in society; to find out who does what, how and when.

- Identify who has access to and control over the resources and benefits.
- Identify the gender needs in a given society.

- **Phase 4: Alternative Analysis.**

Once the required information has been collected, the analysis of the best livelihood alternatives for the community should be carried out. The ones selected should be put in writing in order to materialize them as a project (project design).

- **Phase 5: Project design.**

The project design should include, but not be limited to, the following information: Name; Background and Rationale; Objectives; Definition of activities and outputs; Definition of inputs; Identification of stakeholders, beneficiaries and benefits; Risk analysis and assumptions; Timetable for implementation; Estimated Budget.

- **Phase 6: Project implementation and monitoring.**

To implement a fisheries livelihood project is necessary to have a monitoring plan in place that is feasible and effective.

Monitoring can be defined as the systematic and continuous collecting, analysing and using of information for the purpose of management control and decision-making. Monitoring considers the question ‘Are we doing the project correctly?’ Its purpose is to alert management to any problems that arise during implementation.

The implementers and planners have to agree on monitoring indicators. Monitoring indicators are quantitative and qualitative signs (criteria) for measuring or assessing the achievement of project activities and objectives. Monitoring indicators should be explicit, pertinent and objectively verifiable.

Monitoring Indicators are of four types, namely:

- **Input indicators:** describe what goes on in the project (e.g. number of bricks brought on site and amount of money spent);
- **Output indicators:** describe the project activity (e.g. number of classrooms built);
- **Outcome indicators:** describe the product of the activity (e.g. number of pupils attending the school); and
- **Impact indicators:** measure change in conditions of the community (e.g. reduced illiteracy in the community).

The results of the Household surveys provide extensive background information that can be used as indicators to monitor alternative livelihood initiatives in the ten selected countries of the study. For instance:

- Percentage of poor / vulnerable and non poor households

- Home income
- Percentage of households that manage to make ends meet
- Percentage of households engaged in the activity
- Others...



Box 3: Key points for the success of an alternative livelihood activity

I. THE STUDY: METHODOLOGICAL APPROACH

1. Poverty: definitions, measurements and causes of poverty

Poverty remains one of the severest blights of humankind. Worldwide, more than one billion people continue to live in extreme poverty in spite of all the efforts by international and national donor agencies, governments and individuals over many decades. Poor rural people, and those who are vulnerable to slipping (back) into poverty, have been hit especially hard by the recent global financial crisis and the continuous increase in food prices that has been happening since 2007. Poor and vulnerable people are also among the first to be affected by the impacts of climate change.

Poverty is an important socioeconomic concept that for a long time has been substantially regarded as one-dimensional, especially by economists who used to measure it as lack of income or low expenditure. Recently, there is a growing international consensus about its multidimensional nature and The Millennium Development Goals, adopted by the United Nations General Assembly in 2000, reflect this advanced vision.

Poverty denotes the exclusion of people from socially adequate living standards and includes a series of deprivations. The dimensions of poverty cover different aspects of human capacity: economic (income, livelihoods, decent work), human (health literacy), political (power, rights, voice), socio-cultural (status, dignity) and protection (insecurity, risk, vulnerability). The integration of gender perspective is essential to reduce poverty in all its dimensions. Maintaining natural resource is the key to poverty reduction. New concepts such as voicelessness, powerlessness, vulnerability, lack of self-esteem and lack of opportunity have been incorporated into “poverty” definition.

“Poverty is hunger. Poverty is lack of shelter. Poverty is being sick and not being able to see a doctor. Poverty is not having access to school and not knowing how to read. Poverty is not having a job, is fear for the future, living one day at a time. Poverty is losing a child to illness brought about by unclean water. Poverty is powerlessness, lack of representation and freedom”. (WB, 2008).

There are two underlying threads in this definition. The first is that poverty is essentially related to the notion of absence, lack or deprivation of factors which are necessary for an acceptable quality of life. The second is that the World Bank now sees income poverty as a sub-component of wellbeing, which also includes the notions of vulnerability and inequality.

Vulnerability: groups, households, individuals who may not be income poor but who could be if they were affected by particular shocks, e.g. natural disasters, sudden ill health.

Inequality: the lack of wellbeing arising from the unequal distribution of income, consumption or other attributes across the population.

Two other important concepts that should be differentiated are absolute poverty and relative poverty.

Absolute poverty implies a standard below which the household could not survive in a healthy or satisfying way. That standard is the same in all countries and does not change over time.

Relative poverty is concerned with the inequality in incomes (or consumption) between different groups with no reference to the level of actual income. The standard is defined in terms of the society in which an individual lives and which therefore differs between countries and over time.

Rural poverty has many causes and dimensions and these are often specific to a country and a particular context. The root causes of poverty need to be understood in order to design efficient measures tailored to the needs and strengths of poor people.

Identification of the poor can be done by several conceptually distinct **methods**, and the group of people selected as poor can change considerably according to the criteria used in identification. From the theoretical point of view, poverty cannot be determined by one method over the others, as they all have their strengths and weaknesses; rather, it is the context in which it will be applied that will determine the choice of method. In less developed countries, the preferred method is the cost of basic needs or the Unsatisfied Basic Needs.

Main instruments used to measure the phenomenon of poverty:

- **Poverty Line Method:**

The Poverty Line Method is an indirect method of measurement based on income. A household is classified as poor if its income is less than the value of a given "poverty line". This is defined by assigning monetary values to basic minimum elements considered necessary for each person, and multiplying that value by the number of people in the household.

Moreover it collects information on household income. The cost of the basket is then used as the cut-off point. Households whose income falls below the same will be classified as poor. The result, therefore, provides information on the number of households below the poverty line.

- **The Basic Food Basket:**

This method includes common food in the natural diet of the population of reference. To estimate the monetary value of the BFB, the prices of the cheaper varieties of foods on sale in selected stores where the reference population would generally acquire them are used.

An advantage of this method of poverty measurement is the relatively direct way in which it relies on an empirical estimate of minimum consumption and not on an arbitrary cut-off point. Criticisms of this method are based on the fact that this measurement does not inform about "how poor are the poor". Also questioned is the reliability of income as a measure due to biases in the data collection process. And finally, the calculation of the BFB and the assumptions used to define the final value of the poverty line are weak and imperfect. The value of the BFB in a year is calculated and then the same is adjusted by the CPI for a long period. This implies that the adjustment mechanisms are suitable for use pre-defined structure. It also assumes that the structure of consumption of poor households has not changed, adjusting their preferences to changes in relative prices of the basket models original goods.

- **Unsatisfied Basic Needs:**

This direct method is based on an estimation of critical deprivations. This method consists of checking if households have met a number of needs previously established and considered poor to those who have not achieved. While the situation in each country determines how appropriate an indicator is, there are certain shortcomings that have become the common denominator of the applications of this method, they are:

- a) Overcrowding,
- b) Inadequate housing,
- c) Inadequate water supply,
- d) Absence or inconvenience of health services for disposal of excreta;
- e) Non-attendance of school aged children at the primary school level; and
- f) Use of an indirect indicator of economic capacity.

The last of the indicators, the economic capacity, does not itself measure a basic need, but attempts to reflect the probability that the household has sufficient resources to obtain their consumption capacity. Usually, when a household is lacking in some dimensions, it is considered to be UBN. Therefore, strictly speaking this method measures the number of households that have not met a basic need, but does not necessarily measure poverty.

Advantages:

This is a multi-dimensional and straightforward method. Multidimensional because it encompasses different dimensions of the phenomenon considered (housing, education, etc). It is straightforward as it is determined directly from the observation of the presence of critical gaps in the home. In this sense, the indicator is better than the poverty line because when poverty is measured by household income, it is assumed that this effectively translates into access to the most abstract dimensions which are defined as being a minimum. However, this really depends on the structure of individual household consumption, debt and needs.

A second advantage of this type of measurement is the possibility of breakdown at both the territorial (especially when working with census data), and by type of indicator. This allows poverty maps to design specific measures to combat it and to evaluate their results.

Disadvantages:

Some authors have emphasized that the UBN method is not useful to identify situations of recent poverty-homes that meet their basic needs but have an income insufficient to purchase basic goods and services.

Inter-temporal comparability under the UBN method presents some problems. While comparing an indicator between two different times allows one to know the evolution of a particular unmet need, it does not necessarily serve to evaluate the effectiveness of a policy aimed at improving a specific deficiency, because it can be affected by exogenous factors.

- **Human Development Index:**

This Index is based on a combination of income and other one-dimensional indicators. The United Nations Program for Development (UNDP) assesses the status of "human development", defined as the process of enlarging the choices of individuals. Human development refers not only to satisfy basic needs, but also on human development as a dynamic process of participation. This is reflected in the measurement of development, not as the expansion of goods and wealth, but as the expansion of the individual options.

The HDI includes three key dimensions of human life: longevity, knowledge and decent standard of living.

The key indicator for the first dimension is the life expectancy at birth. There is a strong correlation between long life and proper nutrition, good health, education and other valuable accomplishments. Therefore, life expectancy is a proxy measure for many other variables in the HDI.

With respect to the component referred to as knowledge, this takes into account the level of literacy and gross enrolment as a way to reflect the importance of acquiring high levels of training and thus differentiate the countries with the highest potential from the educational point of view.

The third component, the standard of living is the most difficult to measure. It uses the per capita income, adjusted for purchasing power of income thus achieving a better approximation of the relative power of purchasing items.

Advantages:

The HDI allows the comparability of countries in terms of socio-economic development, going beyond simple measures of GDP per capita. By adding direct measures of social development, the HDI, shows a figure that corresponds better with the notion of socio-economic development if only we stop at the nation's overall wealth.

This methodology is constantly being revised incorporating various measures of the same phenomena or adding other measurements.

Disadvantages:

A common criticism concerns the fact that the HDI reflects average values hiding internal disparities which are evident in the different countries.

The causes of poverty vary considerably from one country to another. Development patterns are determined by history, geography and government. Wars, armed conflicts and state collapse lead to and worsen poverty. They also oppose poverty alleviation factors such as endemic corruption, rent-seeking elites, lack of respect for human rights, inefficient bureaucracies and weak commitment to policy and institutional reforms. Other major causes of poverty are environmental degradation, gender discrimination and the rapid population growth. AIDS has also emerged as a critical issue in relation to poverty alleviation, which requires action in many fields.

2. Methodology

2.1 Country Selection

The study was designed to analyse the situation of ten of the fifteen CARICOM Member States, and thus be able to extrapolate the results to the whole Community.

The selection of the countries was done by means of an appropriate methodology which assures that the selected states are representative of the entire fishery sector in the region, and that they reflect the most frequent problems related to this sector in the Caribbean.

Fourteen of the fifteen CRFM Member States submitted the requested data utilized in the determination of the ten selected countries. No data was received from Antigua and Barbuda as they had indicated that they would not be participating in the Study.

2.1.1 Criteria

The criteria for selection of the ten Member States in which the study would be conducted was determined using socioeconomic information for the classification of the countries within an economic context, given that poverty levels were to be studied; and information related to fisheries, in order to be able to justify the relationship between the different countries and the fisheries sector, as the study/diagnosis was designed to determine the poverty levels of the fishing communities.

- **Socio-Economic Information**

The selected socioeconomic criteria for analysis were:

Population: Data obtained by the countries correspond to 2007 or 2008

Labour Force: People aged 15 and older who meet the International Labour Organization definition of the economically active population: all people who supply labour for the production of goods and services during a specified period. It includes the employed; the unemployed seeking work; and first-time job-seekers.

GDP US\$ millions: The net value of the goods and services produced by a country in a given reference period. Expressed in US\$.

GDP Growth Rate: Annual percentage growth rate of GDP at market prices based on constant local currency.

GDP per capita (US\$): Gross Domestic Product divided by midyear population.

World Bank economy classification: World Bank' main criterion for classifying economies is gross national income (GNI) per capita: Low income, \$935 or less; lower middle income, \$936–3,705; upper middle income, \$3,706–11,455; and high income, \$11,456 or more.

Presence or Absence of a Fishery Administrative System

- **Criteria related to Fishing Sector**
- **Level of dependence on Fisheries**
 - ❖ GDP from fishing and aquaculture (US\$ million)
 - ❖ Percentage from fishing and aquaculture in the GDP
- **Fishing Activities**
 - ❖ Number of Boats
 - ❖ Evolution of the Fishing Fleet in the last five years: If they have increased or decreased and its percentage.
 - ❖ Catches (tons)
 - ❖ Evolution of Catches in the last five years: If they have increased or decreased and its percentage
 - ❖ Fish Exports (tons and value)
 - ❖ Fish Imports (tons and value)
- **Density of Fishing Communities**
 - ❖ Coastline (km)
 - ❖ Employment in the fishery sector: Number of people working in fishing boats, aquaculture or processing facilities, marketing, etc.
 - ❖ Number of fish processing companies
 - ❖ Number of aquaculture and mariculture facilities with economic activity
 - ❖ Percentage of fisheries employment contribution to labour force: Fisheries, aquaculture and fish processing and marketing employment

2.1.2 Methodology

When taking into account each of the variables, every country can be classified into one of the next three groups: LOW, MEDIUM or HIGH

$$\frac{\text{Max. value variable X} - \text{Min. value variable X}}{3} = A$$

$$\begin{aligned} \text{LOW} &= (0, A] \\ \text{MEDIUM} &= (A, 2A] \\ \text{HIGH} &= (2A, \infty) \end{aligned}$$

The countries were included within each group according to the data for the variable, and they were graded as follows:

LOW = 2 points
MEDIUM = 0 points
HIGH = 2 points

In each case, this marking system gives priority to those countries belonging to the Low and High groups.

In parallel, each of the variables was weighted within the two different criteria and sub-criteria, always according to the importance attached to them.

Given that this project's framework is the evaluation of fishing communities, it was decided that fisheries sector criteria will influence the decision by 70%, while socio-economic ones will affect it by just 30%.

2.1.3 Results

Taking into account all the scores obtained after calculating the influence of the criteria in the decision, a ranking was established where the countries with higher scores would be more likely to be studied (See Table 1).

Countries	Punctuation
Trinidad and Tobago	10,20
Barbados	9,90
Saint Vincent and the Grenadines	9,60
Belize	9,20
Haiti	8,90
Montserrat	8,90
Saint Kitts and Nevis	8,70
Guyana	8,60
Grenada	8,50
Jamaica	7,50
Dominica	7,40
The Bahamas	6,90
Saint Lucia	6,30
Suriname	6,20

Table 1: Countries Rating

During the process of selecting the countries, Haiti, despite its fifth place in the ranking, was severely affected by an earthquake in January 2010 and had to be excluded from the ten selected countries due to the level of devastation and disruption.

2.2 The Survey

2.2.1 The Questionnaires

Interviewing was used as the data collection method. Three questionnaires were designed taking into account different sections of the fisheries sector:

Section 1: Household-Fisherman Questionnaire. This part must be filled in by all individuals in the sample for the extractive fishing sector.

Section 2: Household-Aquaculture Questionnaire. This part must be filled in only by owners / managers of aquaculture establishments.

Section 3: Household-Processing Industry Questionnaire. This part must be answered only by owners / managers of fishing products processing establishments.

The three models of questionnaires can be accessed in **Appendix III**

2.2.1.1 Household questionnaire

UNIT (A): IDENTIFICATION

The main objective of this unit was to obtain identification details about the interviewee. The most important variable in this unit is the identification of the fishing community that makes it possible to control the sample size established by statistical means.

A couple of questions in this section refer to migratory movements of the interviewee's family.

UNIT (B): HOUSEHOLD SET-UP AND CHARACTERISTICS OF ITS MEMBERS

In this unit the features of each of the members of the household of the participant are documented.

The household is "the basic residential unit in which economic production, consumption, inheritance, child rearing, and shelter are organized and carried out"; "it [the household] may or may not be synonymous with family.

A household includes all the persons who occupy a housing unit. A housing unit is a house, an apartment, a mobile home, a group of rooms, or a single room that is occupied (or if vacant, is intended for occupancy) as separate living quarters. Separate living quarters are those in which the occupants live and eat separately from any other persons in the building and which have direct access from the outside of the building or through a common hall. The occupants may be a single family, one person living alone, two or more families living together, or any other group of related or unrelated persons who share living arrangements.

Members of the household are considered to mean the following:

- (a) Permanent residents present at the time of interview who live permanently in the household; i.e., who mostly sleep in the household, including those who at the time of interview were temporarily absent for various reasons (work, holiday, illness, etc.), provided that their absence be for a period of fewer than six months.
- (b) Persons of no relation to the head of the household or his / her family members who mostly live in the household, provided that they have no other place of residence.
- (c) Domestic staff who normally reside in the household and their family.

The following are not considered to be members of the household:

- (a) Those who have been absent from the household for a period of over six months during the last year or that have another place of residence.
- (b) Those family members who are temporarily present in the household but normally reside in another residence.
- (c) Those that are absent from the household (for more than six months) for the following reasons:
 - Those suffering chronic illness demanding hospitalisation, the elderly in residential facilities and offenders in correctional facilities.
 - Those in the forces (Army, Air force, etc.)
- (d) Foreigners in the country for temporary work lasting less than six months.
- (e) Those with normal residence in another household: guests and tourists living in the residence for a period of less than six months.
- (f) Those who study in a city other than that of the rest of the household will be considered as members of the household of their city of study, regardless of how often they return or not to their household of origin.

UNIT (C): HOUSEHOLD INCOME

This unit establishes the total income for the Household, considering each of the Activity Branches from which income originates and any remittances from family overseas. Currency and periodicity of said income must be indicated. Additionally a section was included to calculate the value of the income obtained for self-consumption asking the interviewee about the value of the same product in the market.

UNIT (D): ACTIVITY IN THE FISHERY SECTOR

This section has been created to describe the characteristics of Fisheries Sector Workers of a same household. Professional situation, hours per day and days per week worked and activity carried out are the question of this section.

UNIT (E): DWELLING INFORMATION

The aim of this unit is the description of the dwelling occupied by the participant. Different dwelling characteristics and dwelling equipment are listed in the questionnaire. The interviewee must indicate which goods or services are part of the dwelling indicating the quality if required.

UNIT (F): ACQUISITION OF GOODS AND SERVICES

Questions regarding each of the weekly or monthly expenses of the household formed this unit.

UNIT (G): SOCIOECONOMIC ASPECTS

This unit contains questions of a socioeconomic nature in relation to the participant and his / her household.

2.2.1.2 Fisherman questionnaire

UNIT (A): IDENTIFICATION AND EQUIPMENT

This part of the questionnaire is dedicated to collecting information concerning the fishing activity of the interviewee. There is a block of six questions that cover subjects related to fishing equipment owned by the interviewee and its characteristics, or that of nets or the vessel on which they work.

UNIT (B): DEDICATION

This part of the questionnaire concerns the fishing activity of the interviewees. It features a block of five questions that cover subjects concerning their time in the profession and the time that they dedicate to fishing activities.

The main objective of this unit is to find out the working conditions of the fishermen in terms of their experience and their effort to access fishing resources.

UNIT (C): FISHING ACTIVITY INCOMES

This section of the questionnaire concerns income obtained per boat (not per individual) from the sale of catches.

UNIT (D): FISHING ACTIVITY EXPENDITURES

This section of the questionnaire concerns distribution, sum and structure of costs associated with the possession and maintenance of the fishing boat.

UNIT (E): POST-HARVEST TREATMENT AND MARKETING

This part of the questionnaire concerns landing activity and marketing.

UNIT (F): SOCIAL BENEFITS

The main objective of this unit is to find out the working conditions of the fishermen in terms of the different types of social benefits they have access to, be they of the state or otherwise.

UNIT (G): FISHERY POLICY

The main objective of this part of the questionnaire is to gather information on the knowledge of the interviewee concerning the existence of policy, laws or regulations that govern the fishing sector of his / her country. It is also intended to extrapolate details of any possible involvement by the interviewee in planning and decision-making that affects the fishing sector.

UNIT (H): ENVIRONMENTAL INFORMATION

The main objective of this unit is to collect information concerning possible environmental changes that may be affecting the fishing activity of the fishing community in which the interviewee resides.

UNIT (I): MAIN PROBLEMS

The main aim of this unit is to detect the main problems that the interviewee faces when carrying out fishing activities, be they related to lack of landing infrastructure, the workforce, habitual fishing grounds/zones, supply and maintenance, conflict with other users of the coastal area or any other problem (to be detailed).

2.2.1.3 Aquaculture questionnaire

UNIT (A): IDENTIFICATION AND PLANNING

The aim of these two questions is to gather information for the identification of the owner / manager and the aquaculture farm or facility respectively.

UNIT (B): STRUCTURE AND ACTIVITY

This part of the questionnaire gathers information about the aquaculture production technology and about the production of the aquaculture farm/facility.

These questions will show whether or not it is common for the farm/facility owner to also own the land (if the interviewee is the manager, he/she must answer as the owner), or whether it is more common to receive a temporary concession.

UNIT (C): ECONOMIC INFORMATION

This section of the questionnaire aims to provide information concerning the income of the farm / facility (sales, subsidies / donations or other incomes, like partners investment for example), as well as the distribution, sum and structure of costs associated with its possession and maintenance, applicable duties and general economic outcome.

This economic information must refer to a specific time period, i.e. daily, weekly and monthly costs and income. If the interviewee does not know the weekly or monthly sums but does, for example, know the annual sum, the interviewer shall fill in this information, either indicating that costs are annual or calculating these expenses into the requested periods. Using the above example, if the total annual sum is known, for each item, it can be divided by 12 to calculate the monthly sum.

UNIT (D): MARKETING

This part of the questionnaire is dedicated to collecting information concerning the sale and distribution of products obtained in the aquaculture farm/facility.

UNIT (E): EMPLOYMENT

This part of the questionnaire is dedicated to collecting information concerning employment created by the aquaculture business and concerning the benefits that its employees receive in terms of training.

UNIT (F): SOCIAL BENEFITS

The main objective of this unit is to find out the working conditions of the aquaculture activity in terms of the different types of social benefits they have access to, be they of the state or otherwise.

UNIT (G): FISHERY / AQUACULTURE POLICY

The main objective of this part of the questionnaire is to gather information on the knowledge of the interviewee concerning the existence of policy, laws or regulations that govern the aquaculture subsector of his/her country. It is also intended to extrapolate details of any possible involvement by the interviewee, through cooperatives/associations or not, in planning and decision-making processes that affect the aquaculture sector.

UNIT (H): ENVIRONMENTAL INFORMATION

The main objective of this unit is to collect information concerning possible environmental commitments of the aquaculture business and environmental issues that may affect the activities.

UNIT (I): MAIN PROBLEMS

The main aim of this unit is to detect the main problems that the interviewee faces when carrying out aquaculture activities, either related to bureaucracy, access to loans, distribution / transport of the product, source water quality, control of invading species, lack of specialised staff, supply and maintenance, sales, destructive effects of natural disasters, praedial larceny, fulfilment of environmental requirements or any other problem (to be described in "others").

UNIT (J): DEVELOPMENT STRATEGY

The intention of this unit is to find out what are, in the opinion of the interviewee, the strategic actions that would most benefit the development of its productive activity. There are several actions of varying nature: the locating of zones for installing aquaculture facilities, the development and transfer of technology, the improvements in health control and product quality, the speeding up of administrative procedures, the promotion of consumption of aquaculture products, the promotion of market opportunities for aquaculture products, the promotion of production and marketing organizations, the improvement of distribution / transport of aquaculture products, the control of food and water quality, the promotion of investment in aquaculture, the training of specialised technicians, the boosting of R&D&I, the reduction of negative impacts on the environment, the design and implementation of an Action Plan and any others not included (to be indicated in "others").

2.2.1.4 Processing questionnaire

UNIT (A): IDENTIFICATION AND PLANNING

The aim of these two questions is to gather information for the identification of the owner / manager and the fish processing company respectively.

This block of questions provides information concerning the intention of the owner to wind up the business or, conversely, to invest in improvement or enlargement of facilities within the next five (5) years.

Respondents were requested to include all production and infrastructure improvements such as upgrading working conditions and security for employees, their training, hygiene and health control procedures, the reduction of environmental damage, etc.

UNIT (B): STRUCTURE AND ACTIVITY

This part of the questionnaire gathers the most recent information about structure and facilities, types of activities carried out and production of the processing company.

UNIT (C): ECONOMIC INFORMATION

This section of the questionnaire aims to provide the most recent information concerning the company's average income (sales, subsidies/donations or other incomes, such as partners investment for example), as well as the distribution, sum and structure of costs associated with the possession and maintenance of the facility, applicable duties and general economic outcome. This economic information must refer to a specific time period, i.e. daily, weekly and monthly costs and income.

UNIT (D): MARKETING

This part of the questionnaire is dedicated to collecting information concerning the sale and distribution of products obtained in the fish processing facility.

UNIT (E): EMPLOYMENT

This part of the questionnaire is dedicated to collecting information concerning employment created by the fish processing business and concerning the benefits that its employees receive in terms of training.

UNIT (F): SOCIAL BENEFITS

The main objective of this unit is to find out the working conditions of the fish processing activity in terms of the different types of social benefits they have access to, be they of the state or otherwise.

UNIT (G): FISHING / PROCESSING POLICY

The main objective of this part of the questionnaire is to gather information on the knowledge of the interviewee concerning the existence of policy, laws or regulations that govern the fish

processing industry sub-sector of his/her country. It is also intended to extrapolate details of any possible involvement by the interviewee, through cooperatives / associations or not, in planning and decision-making processes that affect the processing sector.

UNIT (H): ENVIRONMENTAL INFORMATION

The main objective of this unit is to collect information concerning possible environmental commitments of the processing industry business and environmental issues that may affect activity.

UNIT (I): MAIN PROBLEMS

The main aim of this unit is to detect the main problems that the interviewee faces when carrying out fish processing activities, either related to bureaucracy, access to loans, distribution / transport of the product, lack of specialised staff, supply and maintenance, market, destructive effects of natural disasters, fulfilment of environmental requirements or any other problem (to be described in "others").

UNIT (J): DEVELOPMENT STRATEGY

The intention of this question is to find out what are, in the opinion of the interviewee, the strategic actions that would most benefit the development of its productive activity. There are several actions of varying nature: the development and transfer of technology, the improvements in health control and product quality, the speeding up of administrative procedures, the promotion of consumption of processed fish products, of market opportunities for aquaculture products and of production and marketing organizations, the improvement of distribution/transport of aquaculture products, the promotion of investment in processing industry, the training of specialised technicians, the boosting of R&D&I (Research, Development and Innovation), the implementation of HACCP systems, the implementation of traceability systems, the implementation of quality certificates, the reduction of negative impacts on the environment, the design and implementation of an Action Plan and any others not included (to be indicated in "others").

2.2.2 Sample Survey Design

The Project Objective is to determine the levels of poverty of the fishing communities and its effects on quality of life and the structure of these communities in order to identify appropriate planning models and to implement alternative programmes for support and to relieve the poverty in the aforementioned communities.

The work will be carried out in ten CARICOM Member States. The selected countries will need to represent the region's fishing sector in its entirety, as well as reflect the most common problems affecting this sector in the Caribbean zone.

The study will need to cover all the fishing populations located along the whole coast in each country, as well as fishing subsectors: capture fisheries (in this case sampling will need to be carried out), fish farming, marketing, processing plants, etc.

The Objective of this Sampling Plan is to define a methodology to be able to carry out the necessary work to meet the aforementioned project objectives.

To fulfil these objectives it will be necessary to carry out a study by means of a questionnaire to be completed by a sample of the population engaged in the fishing sector belonging to the fishing communities in each of the selected countries.

Sampling is a tool with which the desired information can be obtained without incurring unnecessary costs in resources while at the same time minimising errors.

From that comes the need to set objective criteria:

- For the selection of samples and sample sizes.
- For the generation, from the sample, of “good” statistics which enable appropriate conclusions to be drawn.

All the above leads to the need to study the complete design for the sampling process with great care. Phases in the overall design of the sampling process are:

- Definition of the population or set of elements for study. Determination of the frame;
- Selection of the type of sampling technique;
- Setting the method for data collection
- Choosing the sample size
- Setting the margin of error beforehand
- Defining the fieldwork

Definition of the Population to be sampled

The survey will be aimed at the population engaged in the fisheries sector in the fishing communities in each of the ten previously selected countries.

In order to be able to carry out the work to select the sample and subsequently implement the corresponding questionnaires, it will be necessary to have census data for the fishing communities in the selected countries.

The reference timeframe for collecting the socioeconomic data is the year before the implementation of the survey.

Research units

As has already been explained, the statistical units will be the individuals engaged in the fisheries sector in fishing communities in the ten selected countries in the CARICOM region.

Desired degree of precision

The result of sampling studies is always subject to a degree of uncertainty due to the fact that only a part of the population is studied and therefore sampling errors will exist.

This sampling error can be reduced by increasing the sample sizes selected, but this is not effective in the majority of cases as the cost of carrying out the work can shoot up.

In the work for the “Diagnostic Study to Determine Poverty Levels in CARICOM Fishing Communities” the degree of precision aimed for is 5% for a confidence level of 95%. This means that for 95% of the cases taking a sample of size n , the total population will be represented with an error of 5%.

Selection of the data to collect and the questionnaire

Before implementing the survey, it is necessary to take some decisions for good choice of the variables to be included in the questionnaire and the way to collect these.

The most effective method of collecting data in the area of socioeconomic surveys is direct personal interview by means of a surveyor.

The steps to be followed in preparing the questionnaire are defined in Figure 1:

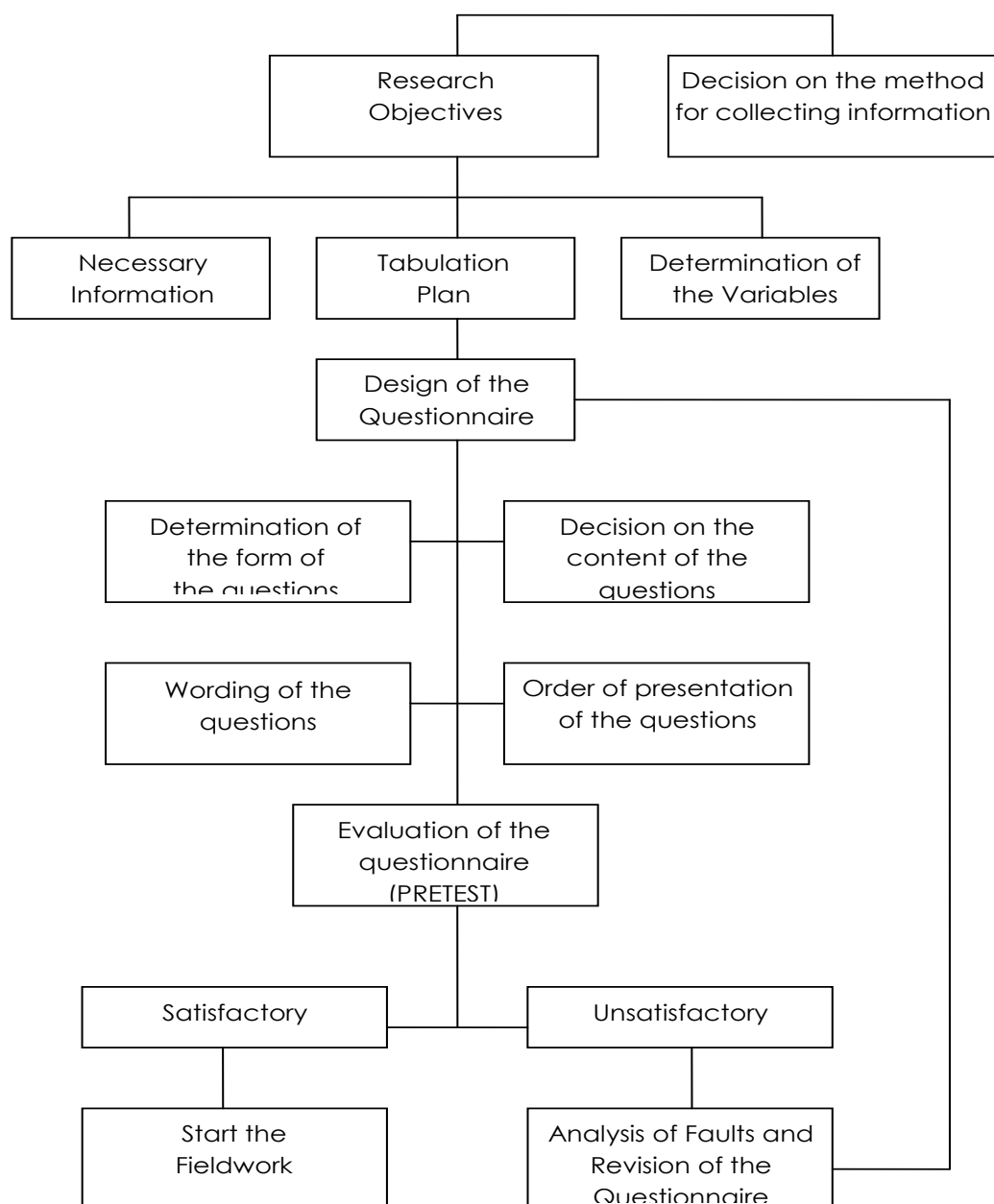


Figure 1. Steps in preparing questionnaires

Selection of the sampling type

Two scenarios will be taken into account in the selection of the sampling type, depending on the initial information available.

Scenario 1

If at the outset individualised data is available on the population engaged in the fisheries sector in the fishing communities in the countries (individual data on the people), as well as one or other known stratification variable related to the study variable, poverty level, such as the income of the inhabitants of the communities or the income level and family data for the fishing communities, a stratified random sampling estimation method will be used.

Stratification of the population will be carried out according to this auxiliary variable correlated with the target variable of poverty level.

The objective of stratification is to obtain communities or groups of communities with the most homogeneous auxiliary variable possible and with the greatest possible differentiation between groups. Homogeneity is sought within the strata and heterogeneity between them, with regard to the poverty level of the fishing communities.

Another criterion sought in the definition of the strata is for there to be a manageable number of them.

Determination of sample size with optimum allocation

The total sample size to estimate the poverty of the population with an expected error of 5% at the 95% confidence level, supposing that an optimum allocation is to be made, is calculated as follows:

$$(1) \quad n = \frac{\left(\sum_{h=1}^{h=28} N_h S_h \right)^2}{\frac{N^2 e^2 \bar{X}^2}{z^2} + \sum_{h=1}^{h=28} N_h S_h^2}$$

Where: h is the number of strata, N_h is the size of stratum h, N is the population size, S_h is the standard deviation of stratum h, \bar{X} is the average value of the auxiliary variable for the whole population, e is the error of the estimated \bar{X} and z is the variable typified for the selected confidence level.

Optimum allocation of the strata is carried out using the following formula:

$$(2) \quad n = \frac{N_h S_h}{\sum_{h=1}^{h=28} N_h S_h}$$

Where: n, h, N_h and S_h are the same statistics as in (1).

With the statistical sampling unit being the person engaged in the fisheries sector in the fishing community, it is necessary for the selection of any unit within the sample to be random within the stratum to which it belongs.

The different elements of the population will be grouped according to the stratum to which they belong. In each of these groups it will then be randomly sorted whether they belong to the stratum sample or not. The result is a set of sub-samples which are random and independent of each other.

The size of each of the aforementioned sub-samples will be that determined beforehand by the permitted level of error, plus 5% intended to ensure that the minimum number of valid responses demanded by the selected scenario are available in a single batch. This oversampling is intended to reduce the total costs of sampling as the main cost is the survey takers' travel to the towns where the sampling units are, plus the cost of interviewing each of them. If the no replies or the invalidated responses for a given stratum prevented the

minimum number for the selected scenario from being reached and it was necessary to repeat the selection – and, therefore, for the surveyors to travel again – the overall costs of sampling would increase appreciably.

The relevant formulas for estimation of the stratified random sampling are:

- **Estimation of the population mean, \hat{Y}_s :**
(3)

Where: \bar{x}_h the mean of the $\hat{Y}_s = \sum_{h=1}^{h=L} W_h \bar{x}_h$ auxiliary variable in stratum h and $W_h = N_h/N$ is the weighting for stratum h.

- **Estimated variance of the population mean, $v(\hat{Y}_s)$**

$$(4) \quad v(\hat{Y}_s) = \sum_{h=1}^{h=L} W_h^2 \frac{N_h - n_h}{N_h} \frac{S_h^2}{n_h}$$

Where: N_h is the size of the stratum population and n_h is the size of the sample in stratum h.

- **Estimation of the population total, \hat{Y}_s :**
(5)

Where: N_h is the $\hat{Y}_s = \sum_{h=1}^L N_h \bar{x}_h$ size of the stratum population and \bar{x}_h is the mean of the auxiliary variable in each stratum.

- **Estimated variance for the population total, $v(\hat{Y}_s)$:**
(6)

All the parameters are $v(\hat{Y}_s) = \sum_{h=1}^{h=L} N_h^2 \frac{N_h - n_h}{N_h} \frac{S_h^2}{n_h}$ the same as those described in expression (4).

Scenario 2

If when starting the work only census information is available (individual data on the population engaged in the fishing sector) for the fishing communities, the Simple random sampling estimation method will be used.

If there is no individualised information for each of the individuals engaged in the fishing sector, the method to be used initially will also be simple random sampling, but at the time of collecting information a deliberate or purposive sampling method will be used as information will not be available on the individuals chosen in the sample. Only the number to be surveyed will be known.

It must be taken into account that if this method is used it will be difficult to predict the precision from the sample due to the lack of randomness and the bias that the survey taker may introduce when selecting the elements for the sample.

Determination of sample size

The samples will be obtained by means of the simple random sampling method for a confidence level of 95% and a sampling error of 5%.

The sample sizes will be given by:

$$n = \frac{n_0}{1 + \frac{n_0 - 1}{N}}$$

Where:

Allocation

$$n_0 = \left(\frac{Z_{1-\alpha/2}^2 N}{2\delta} \right)$$

The allocation or division of the sample size among the different groups will be carried out in proportion to the number of inhabitants in each group.

The selection criterion for the packages within each category and sub-category will be by means of random selection for each group.

The relevant formulas for estimation of the simple random sampling are:

- **Estimation of the population mean:** $E(\bar{y})$

$$E(\bar{y}) = \bar{Y}$$

- **Estimated variance of the population mean,** $v(\bar{y})$

$$v(\bar{y}) = \left(\frac{N - n}{N - 1} \right) \frac{v(Y)}{n}$$

- **Estimation of the population total:** $\hat{T}(Y)$

$$\hat{T}(Y) = N\bar{y}$$

- **Estimated variance for the population total:** $v(\hat{T}(Y))$

$$v(\hat{T}(Y)) = N^2 v(\bar{y})$$

2.2.3 Information system

The information system created to introduce all the data/information into a data base is very simple. Two data entry applications were developed to be installed on interviewers' computers, one to introduce information about household-fisherman questionnaires and, the second one, to introduce information concerning household-aquaculture. For the processing industry questionnaire a specific application has not been developed due to the low number of questionnaires. These questionnaires were entered directly in the centralized database. The following diagram (Figure 2) illustrates how the system was constructed from data entry to data analysis:

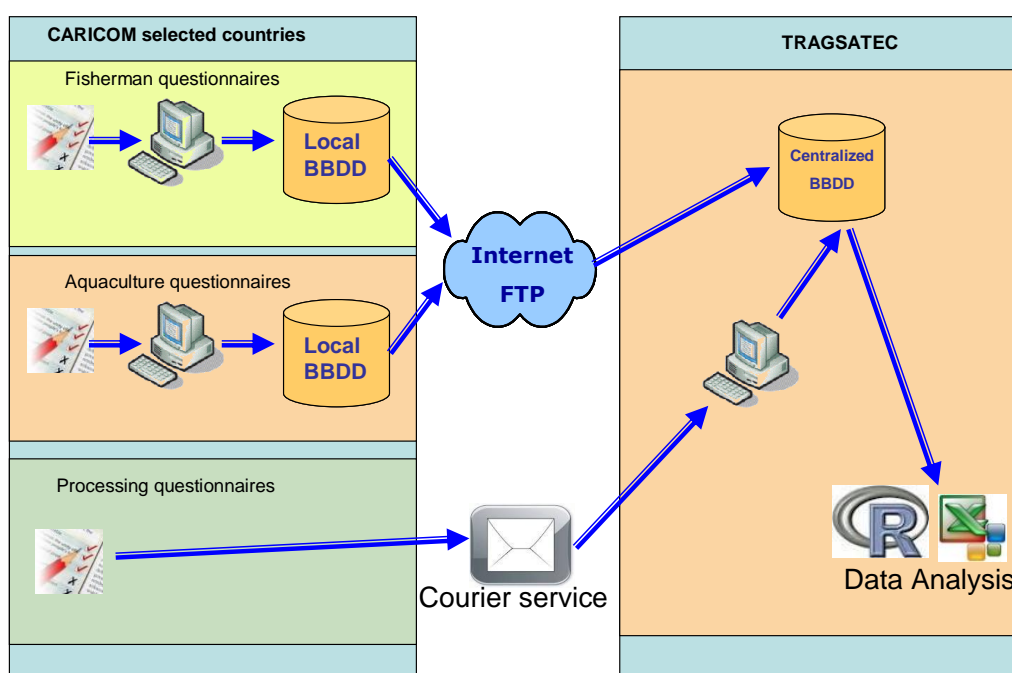


Figure 2. Information system information flow

2.2.3.1 Data entry

For subsequent processing of information, it is necessary for questionnaires to be entered into a computer application. Two data input applications have been developed for household-fishermen and household-aquaculture questionnaires. These applications have been developed with an intuitive interface, through screens that have a similar design to the questionnaire.

The supervisor has an extended version of the application with added functionality to extract the data / information from field agent computers and send it to the information collection centre using ftp protocol. With this application it will also be possible to monitor the coverage obtained by each of the surveyors and the total per country.

Figure 3. Data Entry application screenshot

The application allows the user to browse through different Tabbed pages. Each tab page corresponds to part of a questionnaire section. Different answers of closed questions (with a limited number of answers) have been included in lists as part of a combo box or a list of checkboxes, the user just has to choose the answer by clicking the corresponding item. This method avoids writing mistakes.

All the data are stored in Access Databases, with three database modules/components, one for each type of questionnaire.

2.2.3.2 Data Analysis

The analysis of the data collected was carried out using two different methods. To perform the descriptive analysis MS ACCESS and EXCEL have been used as statistical tools. For more complicated analysis such as country or community clustering, the R application has been used.

R is a language and environment for statistical computing and graphics. It is a GNU project which is similar to the S language and environment which was developed at Bell Laboratories (formerly AT&T, now Lucent Technologies) by John Chambers and colleagues. R can be considered as a different implementation of S. There are some important differences, but a lot of code written for S runs unaltered under R.

R provides a wide variety of statistical (linear and nonlinear modelling, classical statistical tests, time-series analysis, classification, clustering ...) and graphical techniques, and is highly extensible. The S language is often the vehicle of choice for research in statistical methodology, and R provides an Open Source route to participation in that activity.

One of R's strengths is the ease with which well-designed publication-quality plots can be produced, including mathematical symbols and formulae where needed. Great care has been taken over the defaults for the minor design choices in graphics, but the user retains full control.

R is available as Free Software under the terms of the Free Software Foundation's GNU General Public License in source code form. It compiles and runs on a wide variety of UNIX platforms and similar systems (including FreeBSD and Linux), Windows and MacOS.

R is an integrated suite of software facilities for data handling, calculation and graphical display. It includes:

- an effective data handling and storage facility,
- a suite of operators for calculations on arrays, in particular matrices,
- a large, coherent, integrated collection of intermediate tools for data analysis,
- graphical facilities for data analysis and display either on-screen or on hardcopy, and
- a well-developed, simple and effective programming language which includes conditionals, loops, user-defined recursive functions and input and output facilities.

The term "environment" is intended to characterize it as a fully planned and coherent system, rather than an incremental accretion of very specific and inflexible tools, as is frequently the case with other data analysis software.

R can connect to MS ACCESS DATABASE using the RODB module. This module allows you to extract the information from access and convert it into R dataset.

The Data Exploration Guide included in **Appendix II** explores the use of the Analytic tool “R” and the Database exploration

2.2.4 Training Workshop

The implementation of the field aspects (data gathering) of the Study was executed mainly by technical staff from fisheries administrations in the selected countries. A training workshop in data collection for the technical staff to be involved in the field survey was conducted as part of the overall project.

The **objectives** of the workshop were to:

- Introduce the working group (Project Coordinator, Regional Project Coordinator, surveyors and team of experts) and allocate responsibilities;
- Inform the surveyors and the Regional Project Coordinator about the aims of the Study;
- Inform the surveyors and the Regional Project Coordinator about the surveys that they would undertake and the subsequent analysis to be carried out on the data obtained;
- Review questionnaire items;
- Provide training in data collection techniques; and
- Make the surveyors and Regional Project Coordinator familiar with the field material and the computer application;

There were at least two participants from each of the ten selected countries as well as representatives from CARISEC, CRFM Secretariat and Tragsatec at the Workshop. The List of Participants is given as **Appendix IV**. The Training Workshop was chaired and conducted by Programme Manager, Fisheries Management and Development, CRFM Secretariat in collaboration technical with staff from Tragsatec.

The Consultants provided the surveyors with an overview of the methodology for conducting the survey. This included a brief introduction to the method used for determining sample sizes in each country, an in-depth review of the questions asked, outline of the communications structure, and discussion of the process of analyzing collected data.



Photo 1: Technical staff attending the training workshop

The surveyors were provided with:

- the sampling plan (for each country)
- the questionnaires
- the surveyors -field work manual
- the use of the data entry program

All selected countries involved in the Study were provided with the necessary information regarding the sampling plan to perform the survey.

Based on the review of the sampling methodology and design, it was decided that countries would provide further information which would enable the Tragsatec Team to refine the sampling plan.

The workgroup performed a thorough review of the questionnaires paying particular attention to ease of comprehension; terms used technical soundness, and coverage of the sampled fisheries populations. Some of the recommended adjustments included:

- Adding options for closed questions;
- Rephrasing labels for dwelling arrangements and fishing equipment so that they reflected terms used more frequently in the region;
- Establishing clear, consistent units for measuring currency, length, power;
- Clarification of terminology and inclusion of terms common to the respective countries.

Field testing of the adequacy of the questionnaire was conducted at the Saint George's landing site (Grenada). Working in country teams, each group approached a fisherman at the dock and administered both the Household and Fisherman questionnaires. The time taken to administer the questionnaires was noted along with any other issues arising from the practical application of the survey.

Photo 2: Field testing: two fishermen being interviewed by surveyors.



2.2.5 Field Work

Implementation of the field survey, data entry and transmission activities of the Diagnostic Study began in May 2010. Trained personnel from the fisheries authorities in the ten

participating Member States conducted a total of 1431 interviews with fishers, aquaculture farmers and processors based on the sample plan set out in the Member State's Surveyors' Field Manual. The plan indicated the areas to be sampled and the number of questionnaires needed in order to provide a representative sample of the fisheries sector. Originally, two to three fisheries staff members were selected from each Member State and trained in survey and data collection techniques. However, in Barbados, Grenada, Jamaica, Saint Vincent and the Grenadines and Trinidad and Tobago additional staff members were trained in-country to assist in the implementation of the field survey.

Field surveyors scheduled appointments with processors and aquaculture farmers and randomly selected fishers at landing sites to interview. They administered the questionnaires, noting any changes to the sample population. Such changes included reduced number of fishers due to emigration, retirement or death, relocation of fishers from one landing site to another and non-operational aquaculture farms and processing facilities. Notations were also made when interviewees were unavailable or unwilling to participate in the surveys.

A common challenge in most Member States was gaining participation from the owners of the processing facilities. Senior officials within the fisheries authorities and fisherfolk organizations assisted in contacting the processors to explain the objectives of the survey and request their participation. The field surveyors reassured the owners of the confidential treatment of the collected data and the likely benefits of the Diagnostic Study to the fisheries sector. Identifying data within the questionnaire, such as the name of the facility or its owners, was made optional, as a means of fostering a sense of trust and willingness to cooperate. The survey methodology was also modified to allow persons at various levels of operation within the processing facility to assist in answering the questionnaire.

Data collection exceeded the length of time previously allotted due to difficulties in making contact with fishers, processors and aquaculture farmers. In the Bahamas, Grenada and Saint Vincent and the Grenadines special arrangements were needed to interview fishers residing or camping at landing sites off the main island. There were also instances in which interviewers did not collect all the data required and so additional time was spent revisiting them to obtain complete and accurate information.

During the implementation of field activities the Regional Project Coordinator (RPC) conducted monitoring visits to the Member States, with the objective of ensuring that the field activities and data entry were being conducted as planned. On each visit the RPC made a PowerPoint presentation on the project to the fisheries personnel and invited stakeholders in which she provided details on the objectives, methodology and current status, and data management (collection, data entry and storage) and next steps. In countries where data collection was still going on, the RPC accompanied surveyors on field trips to landing sites, farms and processing facilities, observing interview techniques, assisting in data collection and providing technical support as needed. The completed questionnaires were reviewed and samples used for quality control purposes.

Specialized data management software was developed to store and transmit data collected from the survey questionnaires. Prior to and during the monitoring missions, the RPC distributed and installed this software and demonstrated the process for data entry and data transmission. Several bugs were discovered in the software and so it had to be revised many times to correct errors and allow installation and use on all computer systems. Modification

of the software led to further delays in the data entry and data transmission phase of the project.

In June 2011 collection and submission of data under the Diagnostic Study was completed. Member States submitted all completed databases and questionnaires. Table 2 shows the number of questionnaires collected for each country.

Country	Fishers	Aquaculture	Processing	Total
BAHAMAS	104	-	5	109
BARBADOS	86	1	9	96
BELIZE	81	35	3	119
GRENADA	124	-	3	127
GUYANA	133	18	16	167
JAMAICA	341	139	5	485
MONTserrat	41	-	-	41
SAINT KITTS AND NEVIS	66	1	4	71
TRINIDAD AND TOBAGO	126	16	16	158
SAINT VINCENT AND THE GRENADINES	72	-	4	76
Total general	1,174	210	65	1,449

Table 2: Number of questionnaires collected for each country

2.3 The Analysis

The information stored in the centralized database must be processed and edited before it could be analysed. The information was been processed in three phases:

Information merging. The information of the three questionnaires was stored in the same data base, establishing the relationship between all database objects. This was necessary to analyze household information (household questions are common to all questionnaires).

Information editing. Information was edited appropriately, based on available information, to mitigate or correct detectable errors.

Coding. Codes were added to collected data to identify aspects of data quality from the collection (e.g. missing data) in order to allow users to appropriately analyse the data. Codes added to convert information collected as text into a form that permits immediate analysis must use standardized codes, when available, to enhance comparability.

Running these phases, some problems were found, which are listed below.

2.3.1 Main problems

- **Non-response.** The non-response rates are particularly high in the economic questions. This type of problem has been solved in some cases using other variables. For instance, missing household incomes were estimated using household expenditures and the question 1 of household socioeconomic aspects (Regarding the total net income of your household, to what extent do you normally make ends meet?).

- **Biased data.** Normally this type of problem is produced by a misunderstanding of the question. The problem is detected by comparing the percentage structure of different responses. For instance, questions related to employers in both aquaculture and processing questionnaires. Large differences detected in the wages between countries and between sexes in the same country suggest that the content of the variable does not have the expected values.
- **Species Coding.** All questions containing species names were coded with the FAO code AL3. In many cases the scientific name was not related to the local name and the operator was forced to investigate local names (Regional Project Coordinator helped a lot in finding species).
- **Unit problems.** Sometimes the interviewer used different units than specified in the questionnaire. Conversions were carried out to homogenise the units.

2.3.2 Analysis methodology

Statistical analysis was carried out in three ways:

- **Descriptive statistics.** Descriptive statistics describe patterns and general trends in a data set. In most cases, descriptive statistics are used to examine or explore one variable at a time.
- **Indicators selection.** Depending on the needs for knowledge, special ratios have been constructed to show the relationship between different variables of the Study.
- **Multivariate study.** As the name indicates, multivariate analysis comprises a set of techniques dedicated to the analysis of data sets with more than one variable. Several of these techniques were developed recently in part because they require the computational capabilities of modern computers. Also, because most of them are recent, these techniques are not always unified in their presentation, and the choice of the proper technique for a given problem is often difficult. For this study cluster analysis has been selected to show the relationship between countries and fishing communities.

2.3.3 Unsatisfied Basic Needs (UNB) Index

The main purpose of the study is to measure the standard of living in fishing communities in the CARICOM region, with a special emphasis on deprivation – its characteristics, and geographic distribution. For this purpose it was decided to use the Unsatisfied Basic Needs method.

This multidimensional and straightforward method will allow us to encompass different dimensions of the phenomenon considered (housing, education, etc) from the observation of the presence of critical gaps in the home. In this sense, this indicator is better than the poverty line because when poverty is measured by household income, it is assumed that this effectively translates into access to the most abstract dimensions which are defined as being a minimum. However, this really depends on the structure of individual household consumption, debt and needs.

Another reason for choosing this type of measurement is that it allows a breakdown at both the territorial (especially when working with census data), and by type of indicator. This allows building poverty maps to design specific measures to combat it and to evaluate their results.

The methodology applied in this study is based on:

- Applying a wide definition of poverty based on viewing poverty as a multidimensional phenomenon, defined according to human poverty concepts;
- Applying a measure of the actual achieved standards of living in the CARICOM Region, from the lowest to the highest levels. This was identified by the results of the field investigation and the questionnaire used. Measurements were made by building an indicator called the Living Standards Index.
- Defining deprivation (meaning human poverty) as the lack of satisfaction of basic needs. This was determined by a “threshold,” demarking between deprivation and other living conditions.

Four components have been considered as the most important factors of the UBN index:

Dwelling quality

Minimum level of habitability that a dwelling should have to protect the people against environmental factors (environment isolation); provide privacy and comfort to carry out certain biological and social activities (social environment isolation); and not generate feelings of relative deprivation in its inhabitants.

The quality of construction materials was used to assess the ability of housing to isolate individuals from the natural environment, and an overcrowding index was used as a measure of the capacity of a dwelling to isolate from the social environment.

Access to services

The analysis of access to basic services was carried out to measure the level of health conditions of the dwelling. Two indicators are normally used in this analysis- the access to drinking water and the excreta disposal system.

The first indicator refers to the permanent supply of good quality water in enough quantity to meet the needs of food and hygiene.

The second indicator is directly related to the availability of a toilet inside the house, this indicator is directly related to a number of household needs such as excreta removal and personal hygiene. The third need a service must satisfy is hygienic sanitation, avoiding cross-contamination of people by waste. In general, the minimum criteria applied to this indicator is a link between the three types of needs identified as a critical shortage situation combines absence of health service, which does not satisfy the basic necessities to the sharing of the service between several homes, related to privacy and health.

Education

Education is a minimum requirement for people to integrate adequately into productive and social life. Along with family, school is the most important socializing agent.

There are some variables that determine the ability of education to carry out a proper role of social integration. Thus, while it is important to attend an educational establishment the degree of educational backwardness and the quality of education should also be considered.

The indicator of failure to attend school, even when it is not sufficient to identify appropriately generalized situations of deprivation, is highly indicative of the future opportunities for labour market integration. Generally, the age of children is in a range of 5 to 15 years, i.e. the basic need of education is satisfied when it meets the full cycle of primary education.

Economic capacity

This component is directly related to household incomes. Household income is not usually available in censuses and other statistics and must be estimated using indirect methods. In our case we have used a direct method, asking the interviewee directly about Household incomes and costs.

Basic Needs	Dimensions	Variables
Dwelling Quality	Construction Materials	Exterior wall construction materials
		Floor construction materials
		Roof construction materials
	Overcrowding	Nº of rooms and household members
Access to services	Running water service	Running water availability (at home, inside or outside the community)
	Excreta removal service	Toilet availability (at home, inside or outside the community)
Education	Children's schooling	Household member between 5 and 15 years attending school
Economic capacity	Household income	Total income from all household members

Table 3: Basic needs, dimensions and variables

The variables selected here define the dimensions in which they assess the living conditions of the households surveyed. But still needed to determine the minimum degree of satisfaction of every need that will indicate whether the basic need is satisfied or not. A score system has been defined to calculate the basic need index. Minimum score of each variable is 1.

Dwelling Quality	External wall material		Score
	1. Brick		1,5
	2. Wood		1
	3. Waste materials		0,5
	4. Earth		0,5
	5. Cement block		1
	6. Palm tree trunks		0,5
	7. Cardboard, oilskin, packaging wood		0
	Floor material		Score
	1. Soil		0
	2. Brick		1
	3. Common floor tiles		1
	4. Cement		0,5
	5. Mosaic, ceramic, granite, marble		1
	6. Wooden board		1,5
	7. Laminated board		1,5
	8. Carpet		1,5
Access to services	Roof material		Score
	1. Roof tiles		1
	2. Hollow blocks		1
	3. Cement		1
	4. Zinc sheeting		1
	5. Wooden board		1
	6. Reinforced concrete, earthenware or clay block		1
	7. Palm tree trunk		0
	8. Cardboard, oilskin, packaging wood		0
	Overcrowding		Score
Education	>2		0
	<=2		1
	Running water		Score
	In home		1
	In the community		0,5
	Outside the community		0
Economic capacity (direct)	Toilet		Score
	In home		1
	In the community		0,5
	Outside the community		0
Education	Education		Score
	<15 years old and not student		0
	Rest		1
Economic capacity (direct)	Incomes per household member		Score
	<1500US \$ a year per person		0
	>1500US \$ a year per person		1

Table 4: Basic needs variable scores

2.3.4 Fisheries Activity Indicators

Poverty indicators will inform about how poverty is distributed in a community and how the source of income (fisheries) influences such poverty. But it is also necessary to know why the income from fisheries is not higher. Thus, another three questionnaires addressed to fishers and to managers or owners of aquaculture establishments and the fish product processing industry, have been designed in order to improve the knowledge of the fisheries sector in each of the countries that have been selected for the study and, thereby, facilitate the identification of development opportunities. These questionnaires will help to get to know the productivity of fishing, by identifying both income and extraction costs of the fishing sector, as well as many other characteristics of each activity.

The following ratios will constitute economic, social, market and technical indicators of the fishing activity:

Technical indicators

Vessel Physical Productivity (VFP) shows the average production of each vessel in terms of weight of landings.

Capacity Physical Productivity (CFP) indicates average production in terms of weight of landings for each capacity unit (GT) of the vessels.

Power Physical Productivity (PFP) shows the average production in terms of weight of landings for each power unit (HP) of the vessels.

Per vessel Hour Physical Productivity (HFP) indicates the average production in terms of weight of landings for each full fishing hour. The total fishing time (T) results from multiplying the number of fishing hours by working days and then by the number of working days in one year (TD).

Man Physical Productivity (MFP) shows the average production in terms of weight of landings for each man employed.

Economic indicators

Capacity Productivity (PGT) shows average production in terms of market value in the first sale for each capacity unit installed (GT) in the vessels.

Vessel Productivity (PV) shows average production in terms of market value in the first sale for each vessel.

Power Productivity (PP) shows the average production in terms of market value in the first sale for each power unit (HP) of the vessels.

Per Vessel Hour Productivity (PVH) shows the average production in terms of market value in the first sale for each fishing hour.

Man Productivity (MP) shows average production in terms of value in the first sale for each man used.

Market indicators

Landing prices (LP) represents the average market price of landings.

Social indicators

Average wage (AW) indicates the average salary obtained by each man employed.

2.3.5 Poverty Indicators

Importance of Fisheries within Families Index (IFF): This index measures the proportion of income earned by families in relation to total household income. The addition of homes by geographic strata set measures the importance of fisheries in different regions regarding the sustainability of households.

$I_i = \frac{I_f}{I_t}$, where I_f is the revenue generated by fisheries and I_t is the total household income.

Per capita Income in the Fisheries Sector Index (PIFS): This index represents the average income per individual produced by the fisheries activity. To develop this index household members who depend on fisheries and in which proportion have to be considered (not all household members may be engaged in an activity related to the fisheries industry or at least not full time).

$R_F = \frac{\sum_{i=1}^n I_{fi}}{n}$, where I_f is the revenue generated by fishing activity, and n the number of household members

Per capita Expenditure in the Fisheries Sector Index (PEFS): This is a measure of average household expenses where there is a dependency on the fisheries sector (measured by using the Index of importance of fishing within families).

$E_{cf} = \frac{\sum_{i=1}^n E_{fi}}{n \times I_i}$, E_f being the costs of each household member and n the number of household members. This expenditure is corrected with I_i the Index of importance of fishing activity within the household.

Degree of Economic Dependency Index (DED): Number of household members with no incomes divided by the number of income earners. This indicator measures the number of people dependent on one source of income.

$DD = \frac{N_{ni}}{N_i}$, where N_{ni} is the number of household members without incomes and N_i the number of household members with income.

Yield per effort at work (YEW): This is the total income from fisheries activity divided by the hours that have been used to obtain revenue. This performance is comparable (if collected data already exist) with the yield per effort in other productive sectors.

$EW = \frac{I_f}{WT}$, where I_f is the revenue generated by WT fisheries and time spent in hours for obtaining revenue.

2.3.6 Clustering

A really interesting analysis is to group countries or communities with common characteristics. There are statistical methods that offer this possibility and these methods or techniques are called clustering analysis.

Cluster analysis is a collection of statistical methods which identifies groups of samples that behave similarly or show similar characteristics. In common parlance they are also called look-a-like groups. The simplest mechanism is to partition the samples using measurements that capture similarity or distance between samples. In this way, clusters and groups are interchangeable words. Often in market research studies, cluster analysis is also referred to as a segmentation method. In neural network concepts, the clustering method is called unsupervised learning (refers to discovery as against prediction – although discovery in a loose sense may be called prediction, it does not have predefined learning sets to validate the knowledge). Typically in clustering methods, all the samples within a cluster are considered to be equally belonging to the cluster (as against belonging with certain probability). If each observation has its unique probability of belonging to a group (cluster) and the application is more interested in these probabilities then we have to use (binomial) multinomial models.

Clustering algorithms are broadly classified into two types: hierarchical and non-hierarchical algorithms. In the hierarchical procedures, a hierarchy or tree-like structure is constructed to see the relationship among entities (observations or individuals). In the non-hierarchical method a position in the measurement is taken as centre point and distance is measured from such centre point (seed). Identifying the right central position is a big challenge and hence non-hierarchical methods are less popular.

Hierarchical Clustering

There is a concept of ordering involved in this approach. The ordering is driven by how many observations could be combined at a time or what determines that the distance is not statistically different from 0 between two observations or two clusters. The clusters could be arrived at either from weeding out dissimilar observations (divisive method) or joining together similar observations (agglomerative method). Most common statistical packages use agglomerative methods and the most popular agglomerative methods are (1) single linkage (nearest neighbour approach), (2) complete linkage (furthest neighbour), (3) average linkage and (4) Ward's method. All these differ in the definition of distance and what defines longest distance as statistically no-distance or zero-distance. Most of the time, the distance is based on Euclidean distance in the sample axes (Mahalanobis distance is for non-orthogonal samples).

Hierarchical Clustering algorithms

The most commonly used hierarchical agglomerative clustering methods and their characteristics are:

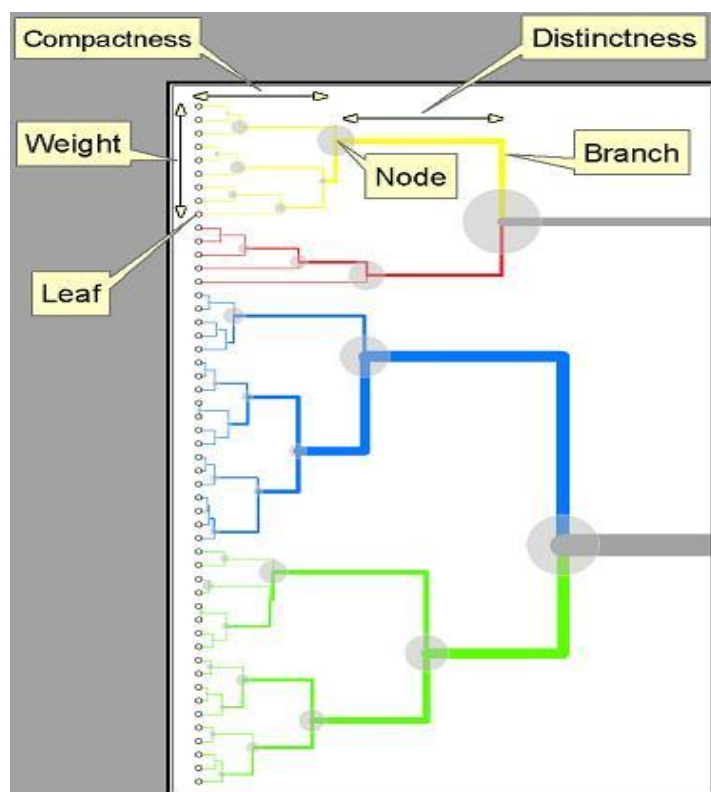
Single link: The single link method joins, at each step, the most similar pair of objects that are not yet in the same cluster. It has some attractive theoretical properties (Jardine and Sibson 1971) and can be implemented relatively efficiently, so it has been widely used. However, it has a tendency toward formation of long straggly clusters, or chaining, which makes it suitable for delineating ellipsoidal clusters but unsuitable for isolating spherical or poorly separated clusters.

Complete link: The complete link method uses the least similar pair between each of two clusters to determine the inter-cluster similarity; it is called complete link because all entities in a cluster are linked to one another within some minimum similarity. Small, tightly bound clusters are characteristic of this method.

Group average link: As the name implies, the group average link method uses the average values of the pair-wise links within a cluster to determine similarity. All objects contribute to inter-cluster similarity, resulting in a structure intermediate between the loosely bound single link clusters and tightly bound complete link clusters. The group average method has ranked well in evaluative studies of clustering methods (Lorr 1983).

Ward's method: Ward's method is also known as the minimum variance method because it joins at each stage the cluster pair whose merger minimizes the increase in the total within-group error sum of squares, based on the Euclidean distance between centroids. It tends to produce homogeneous clusters and a symmetric hierarchy, and its definition of a cluster centre of gravity provides a useful way of representing a cluster. Tests have shown it to be good at recovering cluster structure, though it is sensitive to outliers and poor at recovering elongated clusters (Lorr 1983).

The method to be used in this study is Ward's method because we want to analyse the differences in the structure of the UBN index in different countries and communities.



Dendrogram

Figure 4. Dendrogram structure

One product of cluster analysis is a tree diagram representing the entire process of going from individual points to one big cluster. This diagram is called a dendrogram, and is illustrated below. Once the cluster analysis algorithm has been run, the user must decide how many clusters he or she wants to explore (this is sometimes referred to as "pruning" the dendrogram). In this example we have chosen to look at four clusters (symbolized in red, yellow, green and blue).

Deciding the number of clusters to map can be aided by looking at the dendrogram. There are three key pieces of information that you can get from the dendrogram. In the dendrogram above, the yellow cluster is labelled so that you can see the parts of it that represent these pieces of information.

They are:

Weight - the rough percentage of all individuals that fall within each cluster
Compactness - how similar to one another the elements of a cluster are

Distinctness - how different one cluster is from its closest neighbour. The weight of each cluster is represented by the number of leaves that that branch of the dendrogram leads to. Because each leaf is equally spaced along the Y-axis of the dendrogram, the weight of a cluster is its percentage of the total height of the dendrogram.

The compactness of a cluster represents the minimum distance at which the cluster comes into existence. The horizontal axis of the dendrogram measures the distance between clusters. If a cluster contains only one observation, its compactness is 0. This is why all the leaves line up on the left-hand side of the dendrogram. The relative compactness of the yellow cluster can be estimated by looking at the point at which all of its branches merge together, and the relative distance of that point from the left-hand side of the dendrogram.

The distinctness of a cluster is the distance along the X-axis from the point at which it comes into existence to the point at which it is aggregated into a larger cluster. Distinctness can be seen on the dendrogram as the length of a branch along the horizontal axis.

When choosing a classification, you will want to choose clusters that are as compact and distinct as possible. In the example above, there are four very distinct clusters. However, we could have chosen to break the green cluster into its two components, which are both fairly distinct clusters as well, and are more compact. You may wish to run the cluster analysis a number of times, choosing different numbers of clusters, and exploring how the mapped patterns of those clusters are distributed.

2.4 Regional Workshop

The Regional Workshop was organized to bring together the countries participating in the study, as well the other CRFM Member States, regional organizations (OECS-ESDU and UWI-CERMES) and the CARICOM and the CRFM Secretariat to present the results obtained from the data analysis and discuss their validity.

The main objectives of the workshop were:

- Present the methodology used for the data analysis.
- Approach to database management for each country. Explain how information is stored and how to extract the desired data.
- Present the main findings of the Study.

- Receive from the participant countries, feedback and comments on the results obtained in the Study.
- Provide the necessary tools to enable each country to design their own Livelihoods Assessments.
- Design a pilot project using the information obtained about the Livelihoods Assessments and using data extracted from the data base.
- Obtain consensus on the final structure of the report and the schedule.

There were at least two participants from each of the fifteen CARICOM countries with experience in fisheries management or poverty alleviation; as well as representatives from UWI; OECS-ESDU; CARISEC; CRFM Secretariat and Tragsatec at the Workshop. The List of Participants is given as **Appendix V**.

The workshop took place between 1 and 2 February 2012. The first day's activities were focused on the various phases of the Study while the second day sought to give workshop participants an overview of Livelihood Assessments methodologies.

During day one consultants addressed point by point the main phases of the study, from the methodology used for the countries' selection and the sample size, to the interpretation of results. After the presentation of each phase, plenary discussions were carried out to highlight the most important points and to receive comments and clarifications by the experts from each country and the organizations participating in the workshop.



**Photo 3. Exposure of the Methodology
used in the Diagnostic Study**

In day two, the points that needed to be considered to promote the role of small-scale fisheries and how to design alternative livelihoods for those communities or households where income related to fishing is not sufficient to ensure quality of life were addressed. Evaluation of a hypothetical community and selection of two livelihood alternatives that suit its needs was proposed as a working group activity. Four working groups were established and were provided with all baseline information needed to develop a pilot project for a poverty alleviation program. The four pilot projects can be viewed in **Appendix VI**.

3. Lessons learned

This study has collected an important amount of information about the livelihoods of the members of the fisheries sector in the ten CRFM selected countries, and information concerning the characteristics, levels of development and productivity of the three sectors studied. All this information can be useful when designing new programs and strategies for poverty alleviation. If the same methodology is used in new studies, the information collected may also be useful to track over time the communities studied, and to assess whether the measures taken have improved their members livelihoods.

However, it should be noted that in conducting any study or project, critical points are usually detected, which are difficult, and slow its implementation. These obstacles or problems may be inherent to the project, or may be due to external causes.

Knowing which are the main problems or obstacles when implementing a project or a study is essential, especially if repeating the study is intended, to try to improve its planning and to achieve better results.

Throughout this Study, several critical points have been identified, and as mentioned before it is convenient to take them into consideration in future actions.

One of the first problems encountered is related to the planning of the fieldwork stage. In this Study, the time needed to carry out all interviews planned was underestimated. Throughout a survey process, many inconveniences may arise and delay achieving the target within the desired time, especially when several countries and islands are to be sampled. Some of the obstacles that can slow down the sampling phase are problems in contacting potential interviewees, or interviewer's lack of financial or logistical means to access all areas to be sampled. To avoid compromising the reliability of the study, it should be ensured that all the necessary means are available to carry out all surveys planned for each sector and each community participating in the study.

Another obstacle related to the fieldwork phase may be the degree of understanding of the questions formulated on the questionnaires. Although at the training workshop all sections of the questionnaires were explained, it is possible that some respondents did not capture the object of some questions. This remark is due to the high percentage of responses do not know / no answer found along data analysis process. It is true that this does not need to be due to a misunderstanding of questions, but may also be due to the respondent's intention of not giving his opinion on that subject matter.

Though, obviously, the act of filling in the survey is optional, it is essential to let interviewees see the importance of their responses to drawing conclusions. In many household surveys the economic data of household expenses were not collected, that enabled the assessment of the economic value that is put in household's basket of goods. It has been very difficult to assess also the productivity of the sectors to study due to the lack of the necessary information.

Although it is true that throughout the project the consultant team have received support and valuable contributions by the Programme Manager and the Regional Project Coordinator, a higher frequency of exchange of information would have enabled the contracting party of the Study to keep up with the progress of the study, and at the same time, would allow the consultants to know whether the results obtained so far are consistent.

4. The Diagnostic Study and the Poverty Assessments carried out in CRFM Member States

It is important to note that the results of studies based in different methodologies cannot be compared as different criteria for poverty assessment are used. This Study uses the Unsatisfied Basic Needs for the quantitative analysis of poverty in CARICOM fishing communities, while Poverty Assessments usually are based on minimum food requirements (indigence lines) and minimum food requirements plus an element of non-food expenditure (poverty lines). The reasons why the Unsatisfied Basic Needs Method was chosen have already been explained in the section dedicated to the methodology used for data analysis.

It is logical to obtain higher percentages of poverty at Country Poverty Assessments than those obtained in this Study. While in Poverty Assessments the entire population is being studied, whether or not they are employed or household receive any income, in this Study the population studied are members of the fisheries sectors, who do have a job and therefore their households receive some form of income.

II. INTRODUCTION TO THE CARICOM REGION

5. General context

Caribbean regional architecture is comprised of at least four layers, with the Organisation of Eastern Caribbean States (OECS) having reached the highest level of integration; the Caribbean Community, or CARICOM, which is still advancing towards higher levels of policy and functional cooperation with the establishment of the CSME; the CARIFORUM including all the Caribbean ACPs and Cuba; and the Association of Caribbean States (ACS) including all States in the Caribbean.

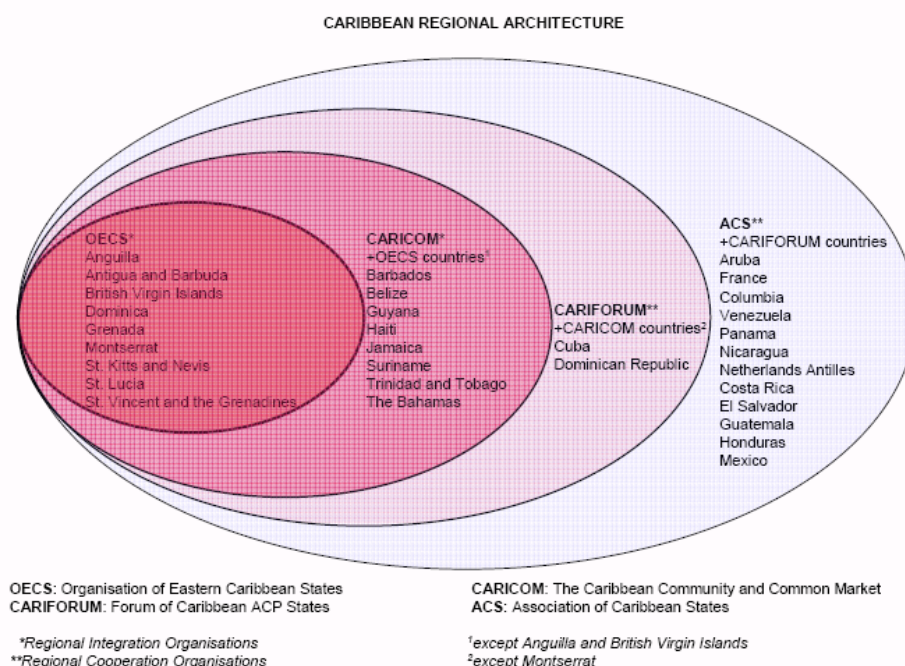


Figure 5: Caribbean Regional architecture
Source: EU Caribbean Regional Initiative Programme

These layers may be seen as a set of concentric circles representing different levels of integration:

OECS is the inner circle of Caribbean economic / monetary integration, incorporating seven of the smaller Caribbean states which are also its full members. Established in 1981 by the Treaty of Basseterre, its main objectives are the economic integration among its Member States and the formation of a Union, this last objective is pursued in the Revised Treaty of Basseterre.

The next circle and main pillar of regional integration in the Caribbean region is CARICOM. It was established in 1973 by the Treaty of Chaguaramas. The three main areas of activity of this regional organisation are: economic cooperation, coordination of foreign policy and functional cooperation including health, education, youth, sports, science, and tax administration. CARICOM, through the Revised Treaty of Chaguaramas is promoting the creation of the Caribbean Single Market and Economy (CSME) which contributes to deepening the integration process, based on both market and economic integration.

CARIFORUM was created in 1992, as a political group including not only the CARICOM Member States, but also the Dominican Republic, Haiti and Suriname (both non-members at that time) and Cuba. The underlying objective of its establishment was the creation of a broader group that could interact with the European Commission as an interlocutor at the regional level.



Photo 4: CARICOM Secretariat in Guyana
Source: CARICOM

Prior to the establishment of the CARIFORUM, regional cooperation in the Caribbean remained confined to English-speaking country members of the CARICOM. The Member States of CARIFORUM are serviced by the CARICOM Secretariat.

All Caribbean countries are also part of the Association of Caribbean States (ACS)²

Small Island Developing States (SIDS) are small-island and low-lying coastal countries that share similar sustainable development challenges, including small population, lack of resources, remoteness, susceptibility to natural disasters, excessive dependence on international trade and vulnerability to global developments. In addition, they suffer from lack of economies of scale, high transportation and communication cost, and costly public administration and infrastructure.

At present, fifty-one small island developing States and territories are included in the list used by the United Nations Department of Economic and Social Affairs. These States and territories often work together through the Alliance of Small Island States (AOSIS).

All countries (except Montserrat) selected for this study are included in the list of SIDS countries.

5.1 Historical setting

- 1958 - 1962 West Indies Federation.
- 1965 the Caribbean Free Trade Association (CARIFTA).
- 1973 Treaty of Chaguramas with which it established the Caribbean Community (CARICOM).

² Based on the European Community-Caribbean Region's Regional Strategy Paper and Regional Indicative programme 2008 - 2013.

- 1981 Treaty of Basseterre. Established the Organisation of Eastern Caribbean States (OECS)
- 1992 Creation of CARIFORUM
- 2001 The Caribbean Single Market and Economy (CSME) is formally adopted.
- 2007 OECS sign an agreement to participate in CARICOM Single Market.
- 2015 it is expected the complete implementation of the Single Economy.

5.2 Geography and climate

CARICOM Member States have different geographical and climatic characteristics among themselves and within the same country. The fact of being part of a continent or a group of islands; the topography; latitude and longitude; or the influence of trade winds, will influence these differences.

The Caribbean Community is part of the Caribbean or West Indies. The region is located southeast of North America, east of Central America, and to the northwest of South America. The ocean environment relevant to CARICOM Member States includes the Caribbean Sea and the central Atlantic region off the coasts of Latin America, from Suriname to Trinidad and Tobago. The Caribbean Sea encompasses a semi-enclosed area of 2.6 million km², while the area from Suriname to Trinidad and Tobago, based on length of coastlines and 200-nautical-mile limit exclusive economic zones (EEZs), covers 310,000 km². The entire area is encompassed within FAO fishing area No. 31, which has a space of 14.5 million km². CARICOM states, because of their EEZs, have sovereign and jurisdictional rights over most of this area, which is endowed with fisheries and other mineral resources³.

With respect to land classification, 32.5% of the land in the whole Caribbean is classified as agricultural area (arable land plus permanent crops) ranging from 2.3% and up to 76.4% in the Dominican Republic. The percentage of land occupied by agricultural area has been decreasing over the last three decades in most Caribbean countries. Forest covers only 19% of the total land area, with the proportion of forested territory within individual countries ranging from 3.2% in Haiti to 90.5% in Suriname. Haiti has lost most of its forest due to the demand for wood as an energy source.

In general terms, the climate is tropical maritime. Climate is influenced by the Gulf and Humboldt ocean currents. The tropical location of the sea helps the water stay at a high moderate temperature, ranging between 21 and 32.2 ° C over the year (70 and 90 degrees F). In most of the territories there are two seasons: a relatively dry one from November to May, where the daily maximum temperatures are between 25-30° Celsius, and a rainy season from June to October where temperatures range from 30 to 35° Celsius. Relative humidity is high throughout the year.

³ CRFM: Second Medium Term Plan 2008 - 2011

Total annual precipitation ranges from 800 to 2,000 mm (30 to 80 inches) but the highest mountains can reach 5,000 mm (200 inches). Regional trade winds, loaded with humidity, leave heavy rain on the sides exposed to them (windward) on islands with high mountains.

The environmental vulnerabilities of the Caribbean include natural hazards such as hurricanes, earthquakes, tsunamis, and volcanic eruptions; deforestation; global climate change; and rising sea levels leading to floods.

The Caribbean hurricane season occurs between June and November, and most strongly between August and September. The air currents that develop on the west coast of Africa make their way across the Atlantic Ocean; some of them become tropical storms and may even become Atlantic hurricanes, especially in areas of low pressure in the eastern Caribbean.



Photo 5: La Soufriere Vulcano (St. Vincent).
Source: definitivecaribbean.blogspot.com



Photo 6: Hurricane Irene. Bahamas.
Source: Independent traveller.com

5.3 Territorial organization

Currently CARICOM has 15 full members, 5 associated members and 7 observers. (Figure 6)

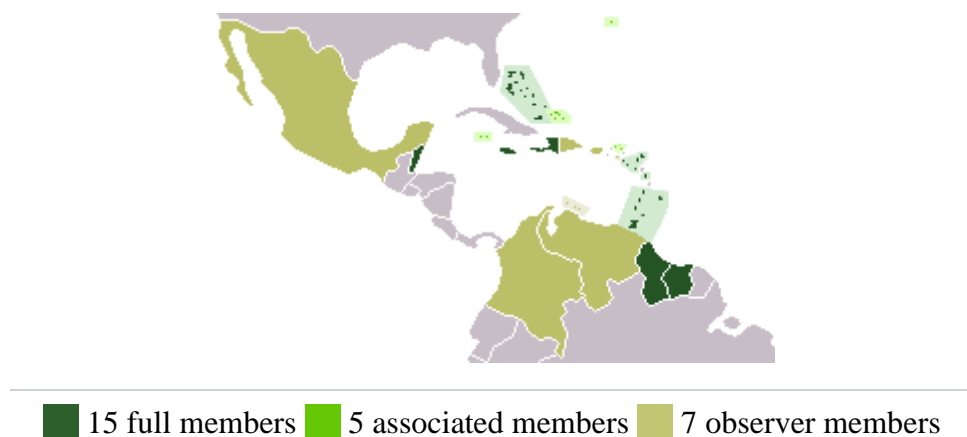


Figure 6: CARICOM members map

Full members occupy territories on mainland and along the group of island in the Caribbean Sea. Figure 7 shows the position in the map of Belize, Suriname, Guyana, The Bahamas, Jamaica, Haiti, Barbados, Dominica, Grenada, Saint Lucia, Saint Vincent and the Grenadines, Trinidad and Tobago, Antigua and Barbuda, Montserrat and Saint Kitts and Nevis.



Figure 7: CARICOM full members map
Source: Caribbean Community Climate Change Centre

Anguilla, Bermuda, British Virgin Islands, Cayman Islands and Turks and Caicos Islands are the CARICOM associated members.

Aruba, Colombia, Curacao, Dominican Republic, México, Netherlands Antilles, Puerto Rico, Saint Maarten and Venezuela are the observer states. All of them are engaged in at least one of CARICOM's technical committees.

5.4 The Society and Policy

The CARICOM States are generally considered democratic, with regular national elections, and well developed local government structures. This has been confirmed by the numerous successful election processes conducted in the Caribbean throughout the last five years allowing incumbent governments to return to office or changes of governments. Transitions to new governments, where there have been changes, have been smooth.

National administrations and democratic institutions are in place and generally well consolidated. These democratic institutions are entrenched in the constitutions of most of the Member States. In some instances, the institutions require capacity development to enable them to successfully carry out their mandates and to implement their work programmes. Accountability structures are in place and are operational in most CARICOM States. They are part of the formal national governance structures.

Civil society has continued to play an important role in the maintenance of democratic traditions. A free press, active trade unions, private sector organisations, human rights bodies, professional organisations, development NGOs and other civil society bodies continue to be very active. The activities of these institutions contribute positively to the governance and accountability structures of the CARICOM States⁴.

⁴ Based on the European Community-Caribbean Region's Regional Strategy Paper and Regional Indicative programme 2008 - 2013.

The growth experienced by the Caribbean over the past four decades has resulted in significant human development improvements in all countries except Haiti. The region is relatively well off by comparison with the rest of the developing world. However, there are important differences in human development from country to country.

5.5 Institutional Structure

The Revised Treaty of Chaguaramas not only established the Caribbean Single Market and Economy it also set out the institutional structure of the Community.

There are two main Organs: **The Conference of Heads of Government (and its Bureau) and The Community Council of Ministers** (The Community Council).

The Conference is the supreme Organ of the Community. It consists of the Heads of Government of the Member States. The Conference, which determines and provides policy direction for the Community, is the final authority for the conclusion of treaties on behalf of the region; for entering into relationships between the Community and international organisations and States; and on questions arising in relation to financial affairs. It may also take decisions in order to establish the financial arrangements necessary to defray expenses.

The Council is the second highest Organ. It consists of Ministers responsible for Community Affairs and any other Minister designated in Member States at their absolute discretion. It is responsible for the development of Community strategic planning and coordination in the areas of economic integration, functional cooperation and external relations.

These main organs are assisted by four 'Organs', three 'bodies' and by the CARICOM Secretariat which is the Principal Administrative Organ⁵.

5.6 Demography

October 2010 the UN and CARICOM's statistics services promoted the development of a population and housing census, but data is still not available.

⁵ http://www.caricom.org/jsp/community_organs/futures_policy_group.jsp

Country	Area Sq Km	2011
Antigua and Barbuda	442.6	87,884
The Bahamas	13,880	313,312
Barbados	430	286,705
Belize	2,806	321,115
Dominica	751	72,969
Grenada	344	108,419
Guyana	214,969	744,768
Haiti	27,750	9,719,932
Jamaica	10,991	2,868,380
Montserrat	102	5,140
Saint Kitts and Nevis	261	50,314
Saint Lucia	616	161,557
Saint Vincent and the Grenadines	389	103,869
Suriname	163,820	491,989
Trinidad and Tobago	5,128	1,227,505
CARICOM	442,680	16,563,858

Table 5. Total Population in CARICOM countries (2011 estimations)
Source: CIA Fact book

For the preparation of this report, the yearly estimates of the CIA Fact book have been used.

Haiti is the most populous country followed by Jamaica and Trinidad and Tobago. Given the area of the country, Montserrat was expected to be the country with the lowest number of inhabitants, but this low value is highlighted by the volcano eruption in 1995 that led many people to emigrate. Saint Kitts and Nevis, Dominica and Antigua and Barbuda are the other countries with less than 100,000 inhabitants.

Estimations of Bahamas, Guyana and Haiti explicitly take into account the effects of excess mortality due to AIDS. Haiti's results also take into account the influence of 2010 earthquake in the population estimate.

5.6.1 Population: structure, size and growth

Considering the male-female ratio over the total population of each country, it can be said that in most cases there is an almost homogeneous male-female proportion. Even so Belize, Trinidad and Tobago, Dominica and Grenada have a positive masculinity index.

In Belize, Haiti and Guyana the bulk of the population is under 50 years of age. In these three countries, inhabitants under 15 years of age represent between 31 and 36% of the total population, registering at the same time the lowest proportion of older people. In contrast, Dominica and Barbados hold the oldest population index, while Barbados and Trinidad and Tobago are the countries with a presumably higher proportion of labour force.

Belize, Antigua and Barbuda and Bahamas are expected to experience the greatest population growth, while in Guyana, Saint Vincent and the Grenadines and Trinidad and Tobago a negative rate is expected.

Photo 7. Girls at school. Haiti.
Source: Authors



5.6.2 Demographic indicators

Belize is the country with highest annual births. The fact of also having the lowest mortality rate, and a balanced immigration and emigration rate, justifies its first position among CARICOM countries with highest growth rate.

Neither Antigua and Barbuda nor Bahamas have a birth rate over the average of the Region but their high growth rate is supported by their mortality rate and in the case of Antigua and Barbuda by its high migrant rate. The arrival of immigrants favours the increase of population, births, and its rejuvenation.

Guyana, Saint Vincent and the Grenadines and Trinidad and Tobago show a birth and death rate within the average of the region, but at the same time show a high rate of emigration, by far the highest of the whole Community.

Montserrat, Barbados, Trinidad and Tobago and Saint Kitts and Nevis display the lowest numbers of children to be borne by a woman, symbolizing the general trend of population decline and aging of their inhabitants.

Belize and Haiti represent the opposite case, countries in which the size of the population continues to grow exceeding the replacement rate and bringing more young people to the population.

Haiti, Belize and Jamaica are the countries with the highest rates of dependency⁶, also being the countries with the highest number of inhabitants under 14 years and crude birth rate.

In Trinidad and Tobago and Barbados the percentage of inhabitants between 15 and 65 represents at least 70% of the population, meaning dependency is less important.

5.7 Economy

The decision in 1989 to establish the CARICOM Single Market and Economy (CSME) was a move to deepen the integration movement and to better respond to the challenges and opportunities presented by globalisation.

While a primary focus of the Common Market was on liberalising trade in goods among the Members, the Single Market and Economy not only expands this process to include services, but also provides for the free movement of capital, skilled labour, and the freedom to establish business enterprises anywhere in the Community. It also deepens economic cooperation among the Member States participating in the Single Market and Economy.

The way CARICOM grants the free movement of goods and services is through measures such as eliminating all barriers to intra-regional movements and harmonising standards to ensure the acceptability of the goods and services traded.

⁶ The demographic dependency of people under 15 and over 64 years old on the population aged between 15 and 64. A high demographic dependency increases the need for income from the potential workforce for maintaining the inactive population's quality of life.

The “Right of Establishment” is applied, which permits the establishment of CARICOM owned businesses in any Member State without restrictions.

The Common External Tariff consists of a rate of duty applied by all Members of the Market to a product imported from a country which is not a member of the market.

Free movement of Capital implies measures such as eliminating foreign exchange controls; convertibility of currencies (or a common currency) and integrated capital market, like a regional stock exchange.

A Common trade policy, which consists of an agreement among the members on matters related to internal and international trade and a coordinated external trade policy negotiated on a joint basis.

The free movement of labour is obtained through measures such as removing all obstacles to intra-regional movement of skills, labour and travel, harmonising social services (education, health, etc.), providing for the transfer of social security benefits and establishing common standards and measures for accreditation and equivalency.

For the smooth running of the CSME it is necessary to implement other measures such as the harmonisation of Laws (company, intellectual property and other laws); and other Economic, Monetary and Fiscal policies.

Economic Policy measure: coordinating and converging macro-economic policies and performance; harmonising foreign investment policy and adopting measures to acquire, develop and transfer appropriate technology.

Monetary Policy measures: coordinating exchange rate and interest rate policies as well as the commercial banking market.

Fiscal Policy measures: including coordinating indirect taxes and national budget deficits.

5.8 International and Regional Relations

In the mid 1980’s it became clear to the leaders of Caribbean Governments that external trade negotiations were going to be extremely important in helping the region adjust to the challenges of the changing international environment. It was also apparent that these negotiations were essential to enabling the Caribbean to take advantage of development opportunities in areas where the Caribbean may have a potential competitive edge.

Given the Region’s limited human and financial resources, external negotiations had to be approached in a coordinated, well-managed and systematic way to avoid use of these resources in an inefficient and ineffective manner. It was considered necessary to create an organization whose task would be to manage the negotiation process under direction of the Regional Governments.

In recognition of these challenges, the Conference of the Heads of Government of the Caribbean Community (CARICOM), formally established the Caribbean Regional Negotiating Machinery (CRNM) in April 1997, later to be renamed, in 2009, as **The Office of Trade Negotiations (OTN)**.

The OTN engages in negotiations on four general level:

- Multilateral Level – This includes negotiations within the World Trade Organization (WTO).
- Inter-regional Level – This includes the negotiations of the Economic Partnership Agreement (EPA) with the European Union.
- Hemispheric Level – This includes the negotiations of the Free Trade Area of the Americas. (FTAA). These negotiations have been dormant since 2003.
- Bilateral Level – This includes the negotiation of agreements between CARICOM and other countries such as: Canada, Costa Rica, and the Dominican Republic.

5.9 Regional Planning

CARICOM, through its development agencies and helped by several donors, has designed some regional strategies and programmes based on its Member States' priorities. These regional strategies are complemented by national ones and both have to be included in their development agendas.

These plans or programmes generally present a strategic and long term holistic view of the Community or country's economic and social development goals including regional or national priorities balancing realities and aspirations. They also include, where appropriate, the poverty reduction strategy and the Millennium Development Goals. In general terms the MDGs are cross-sectoral issues and common goals of all plans. Regional Economic Integration, good governance and poverty reduction are the overarching goals.

The major multilateral donors in the region are the EU, IDB, WB, IMF, OAS and the UN. The major bilateral donors are Canada, China, India, UK and USA, with Japan and Taiwan mainly supporting the Windward Islands, and Finland, France, Germany and Norway also active in the region.

6. Fishery Sector

6.1 Overview of Caribbean Fisheries

The fisheries sector is critical for the Caribbean region since, inter alia, it provides employment for many rural communities, as well as enhancing food security and export earnings.

The nature of the fisheries of the region, which stretches from Suriname to Belize and The Bahamas, is varied. It ranges from the shrimp and ground fish stocks off Guyana and Suriname to the pelagic stocks off Trinidad and Tobago. The Region also contains the reef species of the Eastern Caribbean, and the conch and lobster stocks of Jamaica, The Bahamas and Belize. The migratory pelagic such as wahoo, tuna, flying fish and dolphin fish typically roam through the area (CRFM 2004)⁷.

CRFM (2004) reports that the structure of the fishing industry in the CARICOM region is characterised by:

- a large artisanal fisheries sector in CARICOM States, where the majority of fisherfolk operate on a small scale basis concentrating on mostly primary production, utilising small boats and limited technology which is comprised of traps, cast nets and hook and line;
- an industrial fleet sector of large, modern, capital-intensive vessels which operate mainly in offshore areas, largely targeting high priced and valued added species. Targeted species include spiny lobsters (Jamaica and the Bahamas), conch (Jamaica, the Bahamas and Belize), shrimp and prawns (Guyana, Suriname and Trinidad and Tobago), tuna (wider Caribbean) and flying fish (Eastern Caribbean);
- a processing, distribution and marketing sector; and
- an un-quantified, recreational fisheries sub-sector spanning various aspects of tourism, including domestic and international sports fishing tournaments, yachting, fishing, weekend group and family fishing events. The Caribbean is rated by international magazines as a prime destination for international anglers for billfishes, such as marlins and sailfish, and for several other species of game fishes.



Photo 8. Artisanal fishing boats, Jamaica
Source: Authors



Photo 9. Semi-industrial fishing boats, Guyana
Source: Authors

⁷ CRFM. A Common Fisheries Regime for the Sea. July 2004.

Inland capture fishery activities are limited to the larger countries such as Guyana, Jamaica and Belize.

Culture fisheries are at varying stages of development in the region. However, inland culture fisheries are more established in the larger territories, such as Jamaica and Belize where the dominant species are red tilapia and shrimp, respectively. Guyana is currently seeking to establish a commercial aquaculture subsector. Less developed food fish culture exists in Saint Lucia (sea moss) and Trinidad and Tobago (tilapia).

The Fisheries Sector is strategically important to the CARICOM region and will be increasingly so in the future due to the following reasons:

- It employs over 142,000 persons -directly or indirectly - who are mostly from remote rural communities which lack other income earning opportunities;
- It earns over US \$150 million per year from export and saves the region at least three times as much in foreign exchange since the volume of production is four times the volume of export.
- It accounts for up to 8% of GDP in some Member States.
- It is a major source of protein especially in rural communities which usually exhibit a higher percentage of poverty than the national average.
- It complements and enhances the region's tourism through its use as a vehicle for fishing excursions and fishing tournaments.
- Shrimp, conch, reef fishes, deep slope and bank fishes, offshore pelagics and coastal pelagics make up the marine capture component and is by far the economically most important in the Fisheries Sector. Fish production in CARIFORUM countries in 2000 was approximately 195,000 MT with an estimated value of over US\$500 million.
- Aquaculture has been identified as a sector in the region that has considerable potential for improving social and economic conditions of rural and coastal people, whilst simultaneously contributing to regional and national economic growth, generating employment and earning foreign exchange.

6.2 Main challenges for the development of the fishery sector in CARICOM countries

6.2.1 The need for information systems

Within the CRFM countries current information systems are limited in scope, for the most part being focused on the collection and dissemination of catch and effort data. Among other inputs, the sustainable management of fisheries resources requires access to constant research reports on biological and technological systems, and methodologies as well as related information and data, all of which transcend catch and effort statistics. The development of such a comprehensive data and information system is a costly venture, both with respect to the technology as well as to the human resources required to design / develop the system.

Currently, the fisheries information systems do not collect socio-economic data.

6.2.2 Fishermen organization and co-management

Collectively, fishermen represent the largest number of marine resource users. Their representative organizations have therefore vested interests in ensuring that the fishing industry is sustainable and diversified in order to secure a future for their members. Consequently, governments have been promoting co-management with fishermen's organizations as a strategy for effective fisheries management. It is envisaged that co-management will result in increased stewardship as well as greater responsibility and authority among the fishermen.

The fishermen organizations are however not capable of effectively discharging their roles in the co-management arrangements.

6.2.3 IUU fishing

The scope of the IUU fishing problem in the region encompasses fishing and related activities by nationals and foreign fishers in waters under national jurisdiction and on the adjacent High Seas. It includes:

- Fishing in areas under national jurisdiction without the authorization of the coastal state;
- Fishing which contravenes or undermines conservation and management efforts;
- Failure to effectively exercise the required jurisdiction or control over vessels and nationals in the maritime zones
- Failure to monitor and control vessels flying its flag and fishing on the High Seas;
- Failure to fully and accurately meet fishery and fishing vessels data collection and reporting requirements.

IUU fishing poses one of the biggest threats to fisheries management for developing states and the problem is compounded by a number of factors, such as:

- The large area of ocean space relative to land area;
- The close proximity of the states leading to situations of stocks straddling the borders of neighbouring states;
- The migratory nature of some fisheries resources and the fishing fleets that follow them;
- The lack of financial and technical resources for surveillance and enforcement;
- The lack of skilled manpower for maintaining adequate management systems

The extent of IUU fishing in the CARICOM/CARIFORUM region is not quantified, nor is there the capacity to fully assess its extent throughout the region. The capacity to detect IUU fishing varies according to the ability of the country to provide the human and physical resources to conduct the necessary surveillance and enforcement. Nevertheless, some countries can provide indications that illegal fishing is taking place.

6.2.4 Critical Issues Affecting MCS

The critical issues facing fisheries administrations with respect to MCS are:

Monitoring

- Information on IUU vessels, catch rates, fishers, fishing effort and scientific information on the stocks is not available at the regional level. There is therefore the need to develop and maintain a regional fisheries information system which could include data on IUU vessels as well as a database of vessels and fishers authorized to fish and to make such information accessible to Fisheries Administrations in Member States.
- The capacity of Flag States to effectively monitor their flagged vessels operating on the High Seas.
- Capacity at the national level within fisheries administrations to carry out the monitoring and control functions is very low. In all states, the authorities indicated that there was a severe shortage of trained human resources.

Control

- In most instances legislation or related regulations concerning fisheries management and development in the region needs to be updated in accordance with international agreements and guidelines.
- The prospect of a Common Fisheries Policy and Regime for CARICOM States suggests that there must be an appropriate organization for its implementation. This may also require harmonization of legislation throughout the region, which would create an enabling environment for increased effectiveness of surveillance and enforcement.
- Non-compliance by national and foreign fishermen with the conditions of their licences. This is due to the inadequacy of the enforcement mechanisms as well as awareness that would engender voluntary compliance.

Surveillance and Enforcement

- In many instances the limits of the maritime zones, especially EEZs, are yet to be determined. This issue has implications for enforcement of jurisdictions.
- There is a shortage of appropriate surface and air surveillance assets in most countries. Some Coast Guard organizations face severe financial and human resource

constraints that limit the extent of operation and serviceability of their existing vessels.

- There is a need to utilize available electronic surveillance technologies, for example VMS (Vessel Monitoring System). This would require changes in policy and legislation as they relate to jurisdiction, confidentiality and admissibility of such forms of evidence.

6.2.5 The problem of hurricanes

Hurricanes can cause significant impacts, especially on small islands where vulnerability is accentuated by their smallness. In Saint Kitts and Nevis in 1995, for example, a hurricane resulted in the destruction and loss of vessels and gear, affected 350 fishermen, and caused US\$ 82 million of damage to the fisheries sector.

6.2.6 Aquaculture

The aquaculture / mariculture sector is not well developed in the CARICOM region, with significant aquaculture development in only two countries, Jamaica and Belize. At present, there is pond culture for penaeid shrimp in Belize; tilapia, carp and cachama (*Colossoma* spp.) in Jamaica; and tilapia and penaeid shrimp in Suriname. Also, there is long line culture for algae (*Euchuma* spp. and *Gracelaria* spp.) in Saint Lucia and the mangrove oyster (*Crassostrea rhizophorae*) in Jamaica.

Photo 10. Aquaculture facility in Jamaica
Source: Caribbean journal



Most CARICOM states have limited land and fresh water resources, however some, like Suriname, Guyana and Belize, do have ample supplies. On the other hand, most states have larger expanses of marine space than land mass, which offers the potential for the promotion and development of mariculture. As such the approach to aquaculture / mariculture development will have to be multifaceted in its focus, design and implementation in order to address the needs of those with ample land and fresh water resources and those with less of these resource endowments, while incorporating the commercial elements of aquaculture / mariculture.

6.3 The Caribbean Regional Fisheries Mechanism (CRFM)

The Caribbean Regional Fisheries Mechanism (CRFM) is an inter-governmental organization, created in 2003, with its mission being to “To promote and facilitate the responsible utilization of the region's fisheries and other aquatic resources for the economic and social benefits of the current and future population of the region. Its members are Anguilla, Antigua and Barbuda, The Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Haiti, Jamaica,

Montserrat, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname, Trinidad and Tobago and the Turks and Caicos Islands.

The CRFM consist of three bodies – the Ministerial Council; the Caribbean Fisheries Forum; and the CRFM Secretariat.

The objectives of the CRFM are:

- Efficient management and sustainable development of marine and other aquatic resources within the jurisdictions of its Member States;
- Promotion and establishment of co-operative arrangements among interested Member States for the efficient management of shared, straddling or highly migratory marine and other aquatic resources;
- Provision of technical advisory and consultative services to fisheries divisions of Member States to assist with the development, management and conservation of their marine and other aquatic resources.

6.4 Policy and planning⁸

The Ministerial Council (Ministers responsible for fisheries) is the main policy-making body of the CRFM. The policies are implemented through the Strategic, Medium Term, Biennial and Annual Work Plans. The life of the existing Strategic Plan and the First and Second Medium Term Plans will end on 31 March 2012. Work will begin on the successor Plans, during programme year 2011 / 12. The Strategic Plan covers a range of policy objectives in the fisheries sector and the priority areas that need to be addressed. The CRFM Member States have also been working on the development of a Common Fisheries Policy and Regime for CARICOM.

The objectives of the (approved) Caribbean Community Common Fisheries Policy are to:

- promote the sustainable development of fishing and aquaculture industries in the Caribbean region as a means of, inter alia, increasing trade and export earnings, protecting food and nutrition security, assuring supply to Caribbean markets and improving income and employment opportunities;
- develop harmonised measures and operating procedures for sustainable fisheries management, post-harvest practices, fisheries research and fisheries trade and the administration of the fishing industry;
- improve the welfare and livelihoods of fisheries and fishing communities;
- prevent, deter and eliminate illegal, unreported and unregulated fishing, including by promoting the establishment and maintenance of effective monitoring, control, and surveillance systems;

⁸ CRFM. Biennial Work Plan (2010 - 2012)

- build the institutional capabilities of Participating Parties, inter alia, to conduct research, collect and analyse data, improve networking and collaboration among Participating Parties, formulate and implement policies and make decisions;
- integrate environmental, coastal, and marine management considerations into fisheries policy so as to safeguard fisheries and associated ecosystems from anthropogenic threats and to mitigate the impact of climate change and natural disasters;
- transform the fisheries sector towards being market-oriented, internationally-competitive and environmentally-sustainable, based on the highest international standards of quality assurance and sanitary and phytosanitary systems;
- strengthen, upgrade and modernise fisheries legislation; and
- facilitate the establishment of a regime for SPS for the fisheries sector.

The First Medium Term Plan defines the course of action to be followed by the CRFM during the period 2004 to 2007. The Second Medium Term Plan (MTP2) covers the period 2008-2011. Both documents are based on the Strategic Plan 2002.

6.5 Organization and management of the fisheries sector in CRFM Member States⁹

6.5.1 Regional Level

As mentioned in point 4.3, the CRFM was established in 2003 to work at the regional level to further develop the Region's institutional capacity in the fisheries sector of Member States, by developing, managing and conserving these resources in collaboration with stakeholders so as to benefit the people of the Caribbean region.

CRFM's activities are influenced by the policies outlined in the Agreement Establishing the CRFM. This Agreement focuses on co-operation and collaboration of Member States in the "conservation, management and sustainable utilization of fisheries and related ecosystems" for the welfare and well-being of Caribbean peoples.

6.5.2 National Level

All CRFM Member States operate a Fisheries Division or Ministry with functional responsibility for management of the sector. These are functionally structured to carry out a wide range of regulatory and service tasks, including:

- extension services spanning practices and methods, training and providing technical interventions;
- research – supported by varied forms of laboratory, biological and statistical capabilities;
- resource management with focus on licensing, inspection or monitoring and other conservation practices;

⁹ From "CRFM Second Medium Term Plan 2008-2011

- aquaculture / mariculture with emphasis on development and promotion of activities in the sub-sector; and
- administration with responsibility for accounting, personnel, services and other secretariat support services.

Each division is headed by a Director or Chief and the Ministry with portfolio responsibility that is usually related to agriculture. In addition, there are some countries (for example, Belize) where there exist several fishers' cooperatives with significant representation and advocacy capacities especially in the areas of rationalization of entry to the industry, as well as policies and marketing for the industry.

Fisherfolk Organizations

Fisherfolk organizations exist in each CRFM Member State. These are either incorporated as Cooperatives or Associations, depending on the territory and the organization's objectives (CRFM 2004)¹⁰. CRFM (2004) reports that there are different types of fisherfolk organisations which include:

- marketing or producer types which focus on harvesting, distribution of the product, and sometimes processing;
 - consumer or supplier types which provide gear, equipment, parts and other inputs to their members at more reasonably prices than exist on the open market;
 - service types which supply simple daily production inputs, such as ice and fuel to the traditional areas of offering cultural and social assistance, such as housing, defraying of funeral expenses, day care facilities and health insurance;
 - lobby or pressure group types representing the new emerging types of fishers' organizations which represent the interests of members to Government and other organizations; and
 - credit or financial types that provide avenues for members to save their monies for pecuniary profit, sometimes through investment such as the Cooperative Credit Unions.
- It should be noted that many of these organisations are multifaceted and may be involved in not only the fisheries sector, but other areas of the economy.

Fisheries Advisory Committees / Boards

Fisheries Advisory Committees/Boards operate in all Member States that participated in CFRAMP (CRFM 2004). The Committee/Board is appointed by the Minister with portfolio responsibility for the fisheries sector and consists of stakeholders from this sector. Typically, it provides an avenue for stakeholders to participate in the decision making process in fisheries resource development and management. This is a body that meets at regular sessions

¹⁰ CRFM 2004. Report of Organizational Needs Assessment of Caribbean Fisherfolk Organizations. Funded by the Technical Centre for Rural and Agricultural Development.

to deliberate key issues and problems facing the industry, discuss contending views, and develop plans for the sustainable development and management of the fisheries resources. Committees and Boards can play an important role in the co-management of fisheries resources.

6.6 Major International Treaties on Fisheries ratified by CRFM Member States

This section summarizes the major international treaties ratified by CRFM Member States.

- **United Nations Convention on the Law of the Sea.** This Convention is the globally recognised regime which deals with all matters relating to the sea, as it lays down a comprehensive regime of law and order in the world's oceans and seas establishing rules governing all uses of the oceans and their resources. All CRFM Member States have ratified this UN Convention.
- **FAO Code of Conduct for Responsible Fisheries** and related International Plans of Actions (IPOAs)
 - International Plan of Action for Reducing Incidental Catch of Seabirds in Longline Fisheries;
 - International Plan of Action for Conservation and Management of Sharks;
 - International Plan of Action for the Management of Fishing Capacity; and
 - International Plan of Action for Illegal Unregulated Unreported Fishing.

The Code aims to establish principles for responsible fishing, in accordance with the relevant rules of international law, and to serve as an instrument of reference to help states establish or improve the legal, institutional and managerial arrangements required for responsible and sustainable fishing.

- **Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).** The aim of CITES is to ensure that international trade in specimens of wild animals and plants does not threaten their survival. This Convention directly impinges on fisheries with respect to trade in queen conch (*Strombus gigas*).

6.7 International and Regional Organizations involved in Fisheries Management

- **The Inter-American Tropical Tuna Commission (IATTC).** The IATTC, is responsible for the conservation and management of fisheries for tunas and other species taken by tuna-fishing vessels in the Eastern Pacific Region
- **The International Commission for the Conservation of Atlantic Tuna (ICCAT).** ICCAT is an inter-governmental fishery organization responsible for the conservation of tunas and tuna-like species in the Atlantic Ocean and its adjacent seas
- **International Whaling Commission.** The purpose of the Commission is to provide for the proper conservation of whale stocks and thus facilitate the orderly development of the whaling industry

- **The Latin America Organization for Fishery Development (OLDEPESCA).** The main purpose of the organization is to meet Latin American food requirements adequately, making use of Latin American fishery resource potential for the benefit of Latin American peoples, by concerted action in promoting the constant development of the countries and the permanent strengthening of regional cooperation in this sector
- **Western Central Atlantic Fishery Commission (WECAFC).** The general objective of the Commission is to promote the effective conservation, management and development of the living marine resources of the area of competence of the Commission, in accordance with the FAO Code of Conduct for Responsible Fisheries, and address common problems of fisheries management and development faced by Members of the Commission.

III. MAIN FINDINGS OF THE STUDY

7. The Nature of Poverty in Fishing Communities of the CARICOM Region

7.1 Quantitative Analysis of poverty levels of fishing communities: Key Poverty and Vulnerability indicators

As described in the section concerning the selected indicators, this study is based on the application of a direct method for the quantitative analysis of poverty in the fisheries of the 10 selected countries of CARICOM. Using the Unsatisfied Basic Needs method it is intended to assess the living conditions of households of respondents, regardless of whether they belong to capture fisheries, aquaculture or processing industry. To assess the productivity of the capture fisheries sector some fishing activity indicators and some poverty indicators related to the fisheries sector will be used, this part will be expanded in the section “productivity of the fisheries sector”.

As the four components chosen to study the Unsatisfied Basic Needs and their related variables have already been explained, this section will focus on analysing the results.

The average number of UBN in homes that were part of this study is included in the table below desegregated by country. In the chart the fishing, aquaculture and processing sectors are analysed together. The countries are ordered according to the maximum value in the “0 UBN” field, regardless of how many UBN they have, that is why Saint Vincent & the Grenadines appears before Trinidad and Tobago.

As can be ascertained from the Table 6, every country participating in the study showed households that had at least one unmet basic need. Only Bahamas, Barbados, Montserrat and Saint Kitts and Nevis had at most a single UBN, the homes of Trinidad and Tobago were between 0 and 2 UBN, those of Saint Vincent Grenada and Guyana between 0 and 3, and a few homes in Belize and Jamaica have as many as 4 UBN. This table is a first approach to the conclusions that will be drawn throughout the study.

Country	Number of UBN for the entire fisheries sector (fishing, aquaculture, processing)					
	0	1	2	3	4	Total sample
Bahamas	94.39%	5.61%				100%
Barbados	92.63%	7.37%				100%
Montserrat	92.50%	7.50%				100%
Saint Kitts & Nevis	90.14%	9.86%				100%
Saint Vincent & Grenadines	83.78%	10.81%	4.05%	1.35%		100%
Trinidad & Tobago	83.44%	15.23%	1.32%			100%
Grenada	67.77%	25.62%	4.96%	1.65%		100%
Jamaica	61.15%	27.39%	8.28%	2.97%	0.21%	100%
Belize	54.70%	20.51%	21.37%	2.56%	0.85%	100%
Guyana	50.30%	25.45%	21.82%	2.42%		100%

Table 6: Number of Unsatisfied Basic Needs for the entire fisheries sector. 10 selected countries.

Table 7 below, gives a breakdown of the type of UBNs present in the households surveyed in each country and reports the potential problems that must be confronted to improve the quality of life within the sector.

Bahamas is the country where, taken in proportion, its people have better living conditions. Almost 95% of the population has its basic needs met, the only critical points for the sustainability of a few homes are the access to some services, economic capacity and education.

Barbados, Montserrat and Saint Kitts and Nevis also have a large proportion of homes where their basic needs are met. In Barbados the most critical criteria are economic capacity and education, while in Montserrat they are access to services and in less proportion economic capacity. In St. Kitts and Nevis the main constraints are related to education, access to services and in less proportion economic capacity.

In Saint Vincent and the Grenadines economic capacity and access to services are the main constraints. There are cases where the lack of economic capacity is accompanied by the frailty of dwelling quality.

Trinidad and Tobago's main constraint is child education. The lack of economic capacity is also a minor problem but it can be accompanied by lack of dwelling quality or school enrolment problems.

The following four countries are the ones with the highest percentage of households with UBN and are the countries in which most emphasis will be placed in this section. The most important thing is not the lack of compliance with a criterion; it is observed that a lack of compliance with one is usually accompanied by the lack of compliance with others.

Grenadian households have considerable problems in meeting access to services, dwelling quality criteria and in less proportion economic capacity and educational ones.

Jamaica and Belize, as seen in the above table, have the highest proportion of households with three UBN, and are the only countries with cases of households with 4 UBN. The main weaknesses of Jamaican homes are access to services and failure in dwelling quality. In Belize dwelling quality, and economic capacity, followed by education should be the main concerns.

In Guyana only half of the homes studied met all the Basic Needs. Economic capacity is the main problem followed by dwelling quality.

Type of UBN	Bahamas	Barbados	Montserrat	St K.& N	St Vincent	Trinidad	Grenada	Jamaica	Belize	Guyana	Total Average
None	94.39%	92.63%	92.50%	90.14%	83.78%	83.44%	67.77%	61.15%	54.70%	50.30%	77.08%
Economic capacity (E.C)	1.87%	3.16%	2.50%	1.41%	6.76%	4.64%	4.96%	3.82%	2.56%	13.94%	4.56%
Access to services (A.S)	2.80%	1.05%	5.00%	2.82%	4.05%	1.99%	9.09%	10.83%	3.42%	0.61%	4.17%
Education (ED)	0.93%	2.11%		5.63%		7.28%	1.65%	3.18%	6.84%	3.64%	3.91%
Dwelling quality (D.Q)		1.05%				1.32%	9.92%	9.55%	6.84%	7.27%	5.99%
D.Q + ED					1.35%		0.83%	1.06%	5.13%	1.82%	2.04%
D.Q + E.C						0.66%	2.48%	2.12%	10.26%	16.97%	6.50%
D.Q+ ED+ E.C					1.35%		0.83%	1.49%	2.56%	2.42%	1.73%
ED + E.C					1.35%	0.66%		1.06%	1.71%	3.03%	1.56%
D.Q + A.S							1.65%	3.18%	2.56%		2.47%
A.S +ED								0.64%	2.56%		1.60%
AS + E.C					1.35%			0.21%			0.78%
D.Q + A.S + ED + E.C								0.21%	0.85%		0.53%
A.S + ED + E.C							0.83%	0.21%			0.52%
D.Q + A.S + E.C								1.06%			1.06%
D.Q+ A.S + ED								0.21%			0.21%

Table 7: Types of households Unsatisfied Basic Needs by country

7.2 Qualitative Analysis of poverty levels of Fishing Communities

7.2.1 Geographic distribution of poverty

As mentioned earlier, poverty has a multidimensional character, so in this study the households surveyed were classified into 3 different types: the non-poor, the poor and the vulnerable.

As can be observed in Table 8 below, all countries have a percentage of households susceptible to poverty if they were affected by some kind of shock. Those households are defined as vulnerable, because, although they may have a UBN they are not necessarily poor. The table was constructed taking into account data obtained from the 3 sectors that compose the fisheries sector: extractive fishing sector, processing, aquaculture.

Bahamas, Barbados, Montserrat and Saint Kitts and Nevis are the only countries that have a small percentage of vulnerable households, and no poor ones. Sometimes low income communities, such as Montserrat, may not be considered poor if they see that their basic needs (food, utilities, employment, etc.) are being met and if they see their local community as supportive and non-threatening.

Belize and Guyana are the countries with highest levels of poverty within fishers' households.

Country	Not Poor	Vulnerable	Poor	Total general
BAHAMAS	94.39%	5.61%		100%
BARBADOS	92.63%	7.37%		100%
MONTserrat	92.50%	7.50%		100%
SAINT KITTS AND NEVIS	90.14%	9.86%		100%
SAINT VINCENT AND THE GRENADINES	83.78%	10.81%	5.41%	100%
TRINIDAD AND TOBAGO	83.44%	15.23%	1.32%	100%
GRENADA	67.77%	25.62%	6.61%	100%
JAMAICA	61.15%	27.39%	11.46%	100%
BELIZE	54.70%	19.66%	25.64%	100%
GUYANA	50.30%	25.45%	24.24%	100%
Average selected countries	70.47%	19.76%	9.77%	100%

Table 8: Poverty distribution over the 10 selected countries

The percentage of non-poor, vulnerable and poor households among the respondents from each of the three sectors studied can be observed in Table 9.

In this Study, no household belonging to members of the processing sector were found to be poor. Poor households in the aquaculture sector were only found in Belize and Guyana and in a very small proportion in Jamaica. Poverty in extractive fishing sector households is widespread in all the countries studied except in The Bahamas, Barbados, Montserrat and Saint Kitts and Nevis.

No vulnerable household were found belonging to member of processing sector in The Bahamas and Grenada. In Saint Vincent and the Grenadines half of the members of the processing sector belonged to vulnerable homes, and in Barbados, Grenada, Guyana and Saint Kitts and Nevis, between 22% and 33% of members of the sector lived also in vulnerable households.

Vulnerable homes belonging to aquaculture sector members were only found in Barbados, Belize, Guyana, Jamaica and Trinidad and Tobago. In Barbados, the only home surveyed related to the aquaculture sector was considered vulnerable, and in Guyana the percentage of vulnerable households represent 41% of homes of this sector in this country.

In general terms, in the three types of sectors, the percentage of non-poor households is above the 75% with the exception of Belize, Guyana, Grenada and Jamaica. Non-poor households belonging to members of the aquaculture sector in Belize and Guyana do not account for half of all households headed by members of that sector; the same occurs in Guyana's extractive fishing sector households.

Country	Non-poor			% not poor	Vulnerable			% vulnerable	Poor			% Poor
	A	F	P		A	F	P		A	F	P	
BAHAMAS	-	94.12%	100%	94.39%	-	5.88%	0%	5.61%	-	0%	0%	0%
BARBADOS	0%	95.29%	77.78%	92.63%	100%	4.71%	22.22%	7.37%	0%	0%	0%	0%
MONTserrat	-	92.50%	-	92.50%	-	7.50%	-	7.50%	-	0%	-	0%
SAINT KITTS AND NEVIS	100%	90.91%	75%	90.14%	0%	9.09%	25%	9.86%	-	0%	0%	0,00%
SAINT VINCENT AND THE GRENADINES	-	84.72%	50%	83.78%	-	9.72%	50%	10.81%	0%	5.56%	0%	5,41%
TRINIDAD AND TOBAGO	81.25%	82.64%	92.86%	83.44%	18.75%	15.70%	7.14%	15.23%	0%	1.65%	0%	1,32%
GRENADA	-	66.95%	100%	67.77%	-	26.27%	0%	25.62%	-	6.78%	0%	6,61%
JAMAICA	88.06%	50.30%	60%	61.15%	11.19%	33.73%	40%	27.39%	0.75%	15.96%	0%	11,46%
BELIZE	42.86%	59.49%	66.67%	54.70%	17.14%	20.25%	33.33%	19.66%	40%	20.25%	0%	25,64%
GUYANA	41.18%	48.48%	75%	50.30%	41.18%	23.48%	25%	25.45%	17.65%	28.03%	0%	24,24%
% from total sample	75.49%	69.05%	80.33%	70.47%	15.69%	20.49%	19.67%	19.76%	8.82%	10.46%	0%	9,77%

Table 9: Poverty distribution among the 10 selected countries differentiated by fisheries sector

The following sections will address country by country the results to identify those regions with poor or vulnerable households. The percentages by regions that appear in the following tables are based on the total number of surveys conducted throughout the country, not on the percentage of responses within each region.

In **The Bahamas** survey took place on the islands with highest fishery activity, but above all in Abaco, North Andros and Grand Bahama.

Table 10 disaggregates by region the total proportion of non-poor, vulnerable and poor households found in the Study. According to the results, no poor households have been found, although some vulnerable households can be identified in regions such as North Andros, Central Andros and Abaco. In North Andros, the region with highest percentage of vulnerable homes, the main constraints found are those related to access to services and economic capacity.

Bahamas' surveyed Region	Non-poor	Vulnerable	Poor	% Responses per Region
Central Andros	3.74%	0.93%	0%	4.67%
Long Island	4.67%	0%	0%	4.67%
South Andros	4.67%	0%	0%	4.67%
Crooked Island	5.61%	0%	0%	5.61%
Mayaguana	5.61%	0%	0%	5.61%
Acklins Island	6.54%	0%	0%	6.54%
Eleuthera	6.54%	0%	0%	6.54%
Grand Bahama	11.21%	0%	0%	11.21%
Abaco	23.36%	0.93%	0%	24.30%
North Andros	22.43%	3.74%	0%	26.17%
BAHAMAS	94.39%	5.61%		100%

Table 10: The extent of poverty on households of fisheries sector in Bahamas

The **Barbados** survey took place in all parishes except Saint Andrew. Christchurch, Saint Michael and Saint Philip are the parishes with higher proportion of surveys conducted.

Table 11 disaggregates by region the total proportion of non-poor, vulnerable and poor households found in the Study. According to the results, there are no poor households, although some vulnerable households can be observed in regions such as Saint Michael, Saint James, Saint Joseph, Saint George and Saint Lucy. The most frequent difficulties in the homes of Barbados are related to their economic capacity. In Saint Michael there are also cases of homes with difficulties in access to services. The constraints found in Saint Lucy are related to dwelling quality.

Barbados' surveyed parishes	Non-poor	Vulnerable	Poor	% Responses per parish
Saint Lucy	0%	1.05%	0%	1.05%
Saint Thomas	2.11%	0%	0%	2.11%
Saint George	1.05%	1.05%	0%	2.11%
Saint Joseph	1.05%	1.05%	0%	2.11%
Saint John	5.26%	0%	0%	5.26%
Saint Peter	10.53%	0%	0%	10.53%
Saint Philip	15.79%	0%	0%	15.79%
Saint James	14.74%	2.11%	0%	16.84%
Saint Michael	18.95%	2.11%	0%	21.05%
Christ Church	23.16%	0%	0%	23.16%
BARBADOS	92.63%	7.37%	0%	100%

Table 11: The extent of poverty in households of fisheries sector in Barbados

Household surveys were conducted in the six districts of **Belize** with Toledo, Stann Creek and Belize City being the ones with the highest number of conducted interviews.

Table 12 disaggregates by district the total proportion of non-poor, vulnerable and poor households found. According to the results poor households are present in all districts above all in Toledo and Corozal. Vulnerable houses are more abundant in those regions but are also frequent in Belize City and Stann Creek. In Orange Walk; Corozal and Toledo, the percentage of vulnerable and poor households exceed the percentage of non-poor households. The main constraints of Toledo's households are those related with dwelling quality; these limitations do not appear alone, but are usually accompanied by problems of economic capacity, education or access to services. In Corozal the main difficulties are the combination of dwelling quality with access to services limitations, or those related to education and economic capacity. Stann Creek homes' vulnerabilities are focused on education and dwelling quality.

Belizean surveyed districts	Non-poor	Vulnerable	Poor	% vulnerable + poor	% Responses per district
Cayo	3.42%	0.00%	1.21%	1.21%	4.63%
Belize City	16.24%	4.27%	1.71%	5.98%	22.22%
Orange Walk	2.56%	1.71%	1.71%	3.42%	5.98%
Stann Creek	15.38%	4.27%	1.71%	5.98%	21.37%
Corozal	5.98%	3.42%	5.13%	8.55%	14.53%
Toledo	11.11%	5.98%	11.11%	17.09%	28.21%
BELIZE	54.70%	19.66%	25.64%	45.30%	100%

Table 12: The extent of poverty in households of fisheries sector in Belize

In **Grenada** all parishes were surveyed including Carriacou and Petite Martinique; islands belonging to the Grenadines that have a status of dependency. The parish with the highest proportion of respondents was Saint Andrew; and the one with lowest proportion was Saint David.

Table 13 disaggregates by parish the total proportion of non-poor, vulnerable and poor households found. According to the sample vulnerable houses are present in almost all regions, but poor homes are relegated to Saint Andrew's, Saint Patrick's and Saint John's. In St. Patricks, the percentage of vulnerable and poor households exceeds the percentage of non-poor households. In Saint Andrew's and Saint Patrick's households the main limitations are related to dwelling quality combined with education, access to services or economic capacity. In Saint John's poor households combine the presence of three limitations: access to services, education and economic capacity.

Grenada's surveyed parishes	Non-poor	Vulnerable	Poor	% vulnerable + poor	% Responses per parish
St. David's	1.65%	0%	0%	0%	1.65%
St. George's	12.40%	1.65%	0%	2%	14.05%
St. Mark's	10.74%	1.65%	0%	2%	12.40%
Carriacou	9.09%	2.48%	0%	2%	11.57%
Petite Martinique	9.92%	2.48%	0%	2%	12.40%
St John's	7.44%	4.96%	0.83%	6%	13.22%
St. Andrew's	13.22%	7.44%	2.48%	10%	23.14%
St. Patrick's	3.31%	4.96%	3.31%	8%	11.57%
GRENADA	67.77%	25.62%	6.61%	32%	100%

Table 13: The extent of poverty in households of fisheries sector in Grenada

Guyana's interviews were carried out just in coastal regions except Barima; the regions with the highest number of respondents were Essequibo Islands (West Demerara) and Demerara-Mahaica.

Table 14 disaggregates by region the total proportion of non-poor, vulnerable and poor households found. As in Belize, poor households are present in all regions surveyed of **Guyana** especially in Regions 3, 2 and 5. Region 3, in which the largest number of surveys was made, is the hardest hit with the highest percentage of poor and vulnerable households. The main constraints found in Guyana's poor households follow the same pattern in each region, the most important one being the combination between dwelling quality and economic capacity limitations, and in second place the combination of education and economic capacity. In Region 3 and 5 these three limitations appear combined in the same homes.

Guyana's surveyed Regions	Non-poor	Vulnerable	Poor	% vulnerable + poor	% Responses per Region
Region # 4	20%	3.64%	3.03%	6,67%	26,67%
Region # 6	8.48%	4.24%	3.03%	7,27%	15,76%
Region # 5	3.64%	3.64%	4.24%	7,88%	11,52%
Region # 2	5.45%	4.85%	5.45%	10.30%	15.76%
Region # 3	12.73%	9.09%	8.48%	17.57%	30.30%
GUYANA	50.30%	25.45%	24.24%	49.69%	100%

Table 14: The extent of poverty in households of fisheries sector in Guyana

The **Jamaican** survey process took place in all parishes with Saint Catherine being the one with the highest number of respondents.

Table 15 disaggregates by region the total proportion of non-poor, vulnerable and poor households found, according to the observed sample poor households are present in all the regions above all in Saint Andrew, Manchester, Portland and Saint Catherine. If we consider the combined effect of the presence of vulnerable households and poor households, Saint Catherine and Kingston are the worst off regions. Jamaican poor households' main constraint is dwelling quality, which appears combined with other limitations such as education, economic capacity or access to services. In Kingston and Saint Catherine, dwelling quality appears combined with economic capacity and education in the same households.

Jamaica's surveyed parishes	Non-poor	Vulnerable	Poor	% Vulnerable + poor	% Responses per Region
Westmoreland	5.10%	1.91%	0.21%	2.12%	7.22%
Saint Elizabeth	3.61%	1.27%	0.42%	1.69%	5.31%
Trelawny	3.18%	0.85%	0.64%	1.49%	4.67%
Saint Ann	2.76%	1.91%	0.64%	2.55%	5.31%
Clarendon	5.52%	2.55%	0.64%	3.19%	8.70%
Saint Thomas	3.61%	1.91%	0.64%	2.55%	6.16%
Kingston	6.58%	3.61%	0.64%	4.25%	10.83%
Saint James	2.76%	1.06%	0.85%	1.91%	4.67%
Hanover	2.34%	1.70%	0.85%	2.55%	4.88%
Saint Mary	1.70%	2.34%	0.85%	3.19%	4.88%
Saint Andrew	3.18%	0.85%	1.27%	2.12%	5.31%
Manchester	1.91%	1.06%	1.27%	2.33%	4.25%
Portland	1.49%	1.70%	1.27%	2.97%	4.46%
Saint Catherine	17.41%	4.67%	1.27%	5.94%	23.35%
JAMAICA	61.15%	27.39%	11.46%	38.85%	100%

Table 15: The extent of poverty in households of fisheries sector in Jamaica

In **Montserrat** surveys were done in the west and northwest part of the island, where the fishery industry is developed.

Table 16 disaggregates by region the total proportion of non-poor, vulnerable and poor households found. In Montserrat, as in Bahamas, Barbados and Saint Kitts and Nevis, according to the sample there are no poor homes; only in Carr's Little Bay, the area with the highest percentage of responses, do some households seem to have limitations in access to services and economic capacity.

Montserrat Region	Non-poor	Vulnerable	Poor	% Responses per Region
Bunkum Bay	5%	0%	0%	5%
Ilse Bay	15%	0%	0%	15%
Carr's/Little Bay	72.50%	7.50%	0%	80%
MONTSERRAT	92.50%	7.50%	0%	100%

Table 16: The extent of poverty in households of fisheries sector in Montserrat

In **Saint Kitts and Nevis** both islands were surveyed; the parishes with the highest number of respondents were Saint George in Saint Kitts island; and Saint James and Saint Thomas in Nevis.

Table 17 disaggregates by region the total proportion of non-poor, vulnerable and poor households found, according to the observed sample, there are no poor households, although

some vulnerable households can be observed in regions such as Saint Pauls, Saint Mary/ St John, Saint Thomas and Saint Anne's. The most frequent difficulties in the homes of Saint Kitts and Nevis are related to education; access to services and to a lesser extent its economic capacity.

St Kitts and Nevis parishes	Non-poor	Vulnerable	Poor	% Responses per Region
St. Peter's	9.86%	0%	0%	9.86%
St. Thomas / Trinity	2.82%	0%	0%	2.82%
St. George	18.31%	0%	0%	18.31%
St. James	22.54%	1.40%	0%	23.94%
St Anne's	7.04%	1.41%	0%	8.45%
St. Thomas	14.08%	1.41%	0%	15.49%
St. Mary/St John	7.04%	2.82%	0%	9.86%
St. Pauls	8.45%	2.82%	0%	11.27%
SAINT KITTS AND NEVIS	90.14%	9.86%	0%	100%

Table 17: The extent of poverty in households of fisheries sector in Saint Kitts and Nevis

In **Saint Vincent and the Grenadines**, the survey process took place in all parishes.

Table 18 disaggregates by region the total proportion of non-poor, vulnerable and poor households found, according to the sample observed, vulnerable houses are present in six of the twenty-one regions studied; but poor homes are relegated to Fitz Hughes, Barrouallie and Owia. It should be noted that none of the households studied in Barrouallie were considered not poor. Homes in this region have problems in access to services and economic capacity. Fitz Hughes and Owia households' main constraints are economic capacity and education.

St Vincent and the Grenadines parishes	Non-poor	Vulnerable	Poor	% vulnerable + poor	% Responses per Region
Bequia	5.41%	0%	0%	0%	5.41%
Buccament	4.05%	0%	0%	0%	4.05%
Calliaqua	5.41%	0%	0%	0%	5.41%
Campden Park	4.05%	0%	0%	0%	4.05%
Canouan	4.05%	0%	0%	0%	4.05%
Chateaubelair	4.05%	0%	0%	0%	4.05%
Clare Valley	4.05%	0%	0%	0%	4.05%
Fancy	2.70%	0%	0%	0%	2.70%
Indian Bay	1.35%	0%	0%	0%	1.35%
Lowmans	2.70%	0%	0%	0%	2.70%
Mayreau	4.05%	0%	0%	0%	4.05%
Petit Bordel	4.05%	0%	0%	0%	4.05%
Questelles	4.05%	0%	0%	0%	4.05%
Sandy Bay	4.05%	0%	0%	0%	4.05%
Great Head Bay	2.70%	1.35%	0%	1%	4.05%
Kingstown	10.81%	1.35%	0%	1%	12.16%
Layou	2.70%	1.35%	0%	1%	4.05%
Union Island	5.41%	1.35%	0%	1%	6.76%
Owia	4.05%	0%	1.35%	1%	5.41%
Barrouallie	0%	4.05%	1.35%	5%	5.41%
Fitz Hughes	4.05%	1.35%	2.70%	4%	8.11%
SAINT VINCENT AND THE GRENADINES	83.78%	10.81%	5.41%	16%	100%

Table 18: The extent of poverty in households of fisheries sector in Saint Vincent & the Grenadines

In **Trinidad and Tobago** (Table 19), the data is broken down by counties in Trinidad, while in Tobago it is presented by parishes to obtain more disaggregated data. All counties were surveyed. According to the sample observed, vulnerable houses are present in eleven of the seventeen areas studied; but poor homes are relegated to the north-eastern part of Saint Mary in Tobago and to Saint Patrick in Trinidad. Poor households in each of these areas represent only 0.66% of total households covered in the survey and the main constraints are related to economic capacity combined with education or dwelling quality.

Trinidad and Tobago Areas	Non-poor	Vulnerable	Poor	& vulnerable + poor	% Responses per Area
Nariva	6.62%	0%	0%	0%	6,62%
St. Andrew	3.97%	0%	0%	0%	3,97%
St. George / East	2.65%	0%	0%	0%	2.65%
St. John / East	5.30%	0%	0%	0%	5.30%
St. Mary / East	2.65%	0%	0%	0%	2.65%
St. Paul / East	3.31%	0%	0%	0%	3.31%
Mayaro	3.31%	0.66%	0%	1%	3.97%
St. David / South West	10.60%	0.66%	0%	1%	11.26%
St. George	12.58%	0.66%	0%	1%	13.25%
Victoria	6.62%	0.66%	0%	1%	7.28%
St David/ North East	1.32%	1.32%	0%	1%	2.65%
St. Andrews / South West	5.96%	1.32%	0%	1%	7.28%
St. David	1.99%	1.32%	0%	1%	3.31%
Caroni	7.95%	1.99%	0%	2%	9.93%
St. Patrick / South West	1.32%	1.99%	0%	2%	3.31%
St. Mary / North East	1.32%	1.99%	0.66%	3%	3.97%
St. Patrick	5.96%	2.65%	0.66%	3%	9.27%
TRINIDAD AND TOBAGO	83.44%	15.23%	1.32%	17%	100%

Table 19. The extent of poverty in households of fisheries sector in Trinidad & Tobago

Aside from using the UBN method, a hierarchical cluster statistical method was applied to group countries according to their similarities. The Table below includes the tree diagram (dendrogram) obtained as a result of cluster analysis.

This method considers Belize and Guyana, in terms of similarities, far removed from other countries that comprise this Study. As for the remaining countries, the dendrogram separates them into two groups, one composed of Bahamas, Barbados, Saint Kitts and Nevis and Montserrat, and another group of Trinidad and Tobago, Jamaica, Grenada and Saint Vincent and the Grenadines.

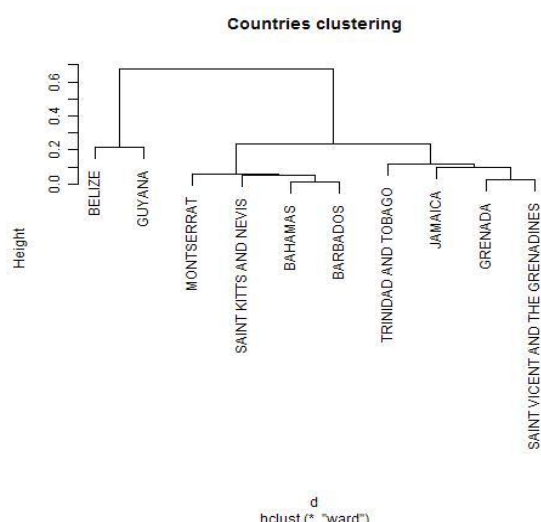


Figure 8: Dendrogram grouping countries according to their similarities after the cluster study

The group composed of the **Bahamas, Barbados, Saint Kitts and Nevis and Montserrat** has in common the low proportion of households with one UBN (vulnerable) and the absence of households with more than a UBN. This makes them the countries with fewer shortcomings of this study, but that does not mean that certain regions and certain vulnerable households do not need political/policy support to improve their quality of life. Constraints of these countries are based on financial capacity and access to services (Table 20).

Country	Constraints	Community	Condition of household
BAHAMAS	Access to services	North Andros	vulnerable
	Education	Abaco	vulnerable
	Economic capacity	Central Andros North Andros	vulnerable
BARBADOS	Economic capacity	Saint George Saint Joseph Saint Michael	vulnerable
	Education	Saint James	vulnerable
	Dwelling quality	Saint Lucy	vulnerable
	Access to services	Saint Michael	vulnerable
MONTSERRAT	Economic capacity	Carr's/Little Bay	vulnerable
	Access to services		
SAINT KITTs AND NEVIS	Economic capacity	St Mary/St. John	vulnerable
	Education	St Mary/St. John St. Pauls	vulnerable
	Access to services	St. Anne's St. Thomas	vulnerable

Table 20: Main Constraints in vulnerable houses of Bahamas, Barbados, Montserrat and St Kitts

Presence of poor households have been noticed in **Trinidad and Tobago, Saint Vincent and the Grenadines, Jamaica and Grenada**, but the percentage does not yet exceed the vulnerable ones'. Still, the proportion of poor and vulnerable households in Grenada and Jamaica are far superior to those in Saint Vincent and the Grenadines and Trinidad and

Tobago. Also, the shortcomings detected are not the same. While in Saint Vincent and the Grenadines and Trinidad and Tobago deficiencies are related to the economic level, the main problems detected in Grenada and Jamaica are firstly quality of their homes and then the economic ones, the access to services and schooling (Tables 21, 22 and 23).

Country	Constraints	Community	Condition of household
SAINT VINCENT AND THE GRENADINES	Economic capacity	Barrouallie, Fitz Hughes Kingstown, Layou, Union Island	vulnerable and poor vulnerable
	Education	Fitz Hughes Owia	vulnerable and poor vulnerable
	Dwelling quality	Fitz Hughes, Owia	poor
	Access to services	Barrouallie Great Head Bay	vulnerable and poor vulnerable
TRINIDAD AND TOBAGO	Economic capacity	Caroni, St. David, St. David / South West, St. George St. Mary / North East St. Patrick	vulnerable poor vulnerable and poor
	Education	Caroni, St David/ North East, St. Andrews / South West, St. Patrick, St. Patrick / South West, Victoria St. Mary / North East	vulnerable vulnerable and poor
	Dwelling quality	St. Mary / North East St. Patrick	vulnerable poor
	Access to services	Mayaro, St. Patrick	vulnerable

Table 21: Main Constraints in vulnerable and poor houses of Saint Vincent and Trinidad and Tobago

Country	Constraints	Community	Condition of household
GRENADA	Economic capacity	Petite Martinique, St John's, St. Mark's St. Andrew's, St. Patrick's	vulnerable vulnerable and poor
	Education	St John's, St. Andrew's	vulnerable and poor
	Dwelling quality	Carriacou, Petite Martinique, St. George's St. Andrew's, St. Patrick's	vulnerable vulnerable and poor
	Access to services	St John's, St. Andrew's, St. Patrick's	vulnerable and poor

Table 22: Main Constraints in vulnerable and poor houses of Grenada

Country	Constraints	Community	Condition of household
JAMAICA	Economic capacity	Hanover, Manchester, Saint Andrew, Saint Elizabeth, Saint James, Westmoreland Kingston ,Portland, Saint Ann, Saint Catherine, Saint Mary, Saint Thomas	poor vulnerable and poor
	Education	Clarendon, Hanover, Portland, Saint Ann, Saint Catherine, Saint Elizabeth, Saint Mary, Trelawny Westmoreland Kingston, Manchester, Saint Andrew, Saint James, Saint Thomas	vulnerable and poor vulnerable poor
	Dwelling quality	Clarendon, Hanover, Kingston, Manchester, Portland, Saint Andrew, Saint Ann, Saint Catherine, Saint Elizabeth, Saint James, Saint Mary, Saint Thomas, Trelawny, Westmoreland, Manchester	vulnerable and poor vulnerable
	Access to services	Clarendon, Hanover, Kingston, Manchester, Portland, Saint Andrew, Saint Ann, Saint Catherine, Saint James, Saint Mary, Trelawny, Westmoreland Saint Elizabeth Saint Thomas	vulnerable and poor vulnerable poor

Table 23: Main Constraints in vulnerable and poor houses of Jamaica

The third group comprises the countries in which almost half of the households surveyed were part of the groups of poor or vulnerable household, **Guyana** and **Belize**. In addition, in these countries the number of poor households is higher or equal to vulnerable ones. Main difficulties for the members of these countries are in the area of economic capacity and dwelling quality.

Country	Constraints	Community	Condition of household
GUYANA	Economic capacity	Region # 2, Region # 3, Region # 4 Region # 5, Region # 6	vulnerable and poor
	Education	Region # 2 Region # 3 Region # 5 Region # 4 Region # 6	vulnerable and poor vulnerable poor
	Dwelling quality	Region # 2, Region # 3, Region # 4 Region # 5, Region # 6	vulnerable and poor
	Access to services	Region # 6	vulnerable
BELIZE	Economic capacity	Belize City. Cayo, Corozal, Stann Creek Orange Walk, Toledo	poor vulnerable and poor
	Education	Belize City Cayo, Orange Walk Corozal, Stann Creek, Toledo	vulnerables vulnerable and poor poor
	Dwelling quality	Belize City, Corozal, Stann Creek, Toledo	vulnerable and poor

Country	Constraints	Community	Condition of household
		Cayo, Orange Walk	poor
	Access to services	Cayo, Corozal, Stann Creek Toledo	poor vulnerable and poor

Table 24: Main Constraints in vulnerable and poor houses of Guyana and Belize

7.2.2 Demographic characteristics of the poor

Before describing the demographic characteristics of the poor population detected in each country, attention will be focused on the vulnerable for a moment.

Members of the fishing sector belonging to **vulnerable households** are between 36 and 65 years old, although in Trinidad and Tobago, Belize and Jamaica abound sector members belonging to the age group 26 - 35 years. Almost all respondents were men, except in Trinidad and Tobago, Saint Vincent and the Grenadines and Barbados, where between 12% and 16% of respondents were women.

The average of members per household considered vulnerable is 3.5. In general terms, in all countries studied, vulnerable households belonging to the fisheries sector are composed of members between 15 and 55 years, abounding in both adult members, except Belize, Grenada, Jamaica and Saint Kitts and Nevis where there is a high percentage of members under 15 years.

The main differences found between poor and non-poor households is the average number of members living in a household, and the degree of illiteracy or semi literacy in members of the working class.

While in the general sample the average of members constituting a household was around 3 members, in **poor households** the average is close to 5.9 members. The impoverished population dependent on the fishing sector is comprised of a significant percentage of young people under 15 years old. The percentage of members by age class decreases as the population grows older, having in a few cases, household members over 65 years.

In the Study of the general data it was noted that 4.3% the percentage of illiteracy and semi-literacy within the population of the fishing industry interviewed, of the population considered poor contributes to this data by 1.3%, but this percentage increases to 12.50% if reference is only made to the population considered poor.

83% of respondents considered poor in Belize are mainly men aged between 26 and 55 years, but representatives have also been found belonging to the range of 15 to 25 years and the range of 56 to 65. 96% of them are married or living in a common-law relationships and the rest are single (Figure 9).

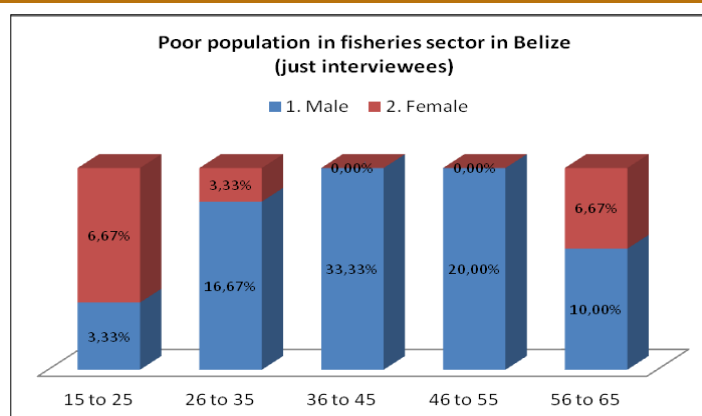


Figure 9: Poor population in fisheries sector in Belize

It is noteworthy that within the poor communities belonging to the fisheries sector, the illiteracy rate is higher than compared to the average obtained by considering all the surveyed population in the country. In Belize, 10% of respondents considered poor are illiterate, and 3.3% semi-illiterate. 73% of respondents have basic or primary level education.

Poor households in Belize are formed by an average of 6.7 members, mainly composed by two heads of household and in most cases for more than two children less than 25 years. The 76.24% of all family members surveyed are under 35 years while those over 56 years represent only 4% of the total.

In **Grenada**, as shown in Figure 10, all respondents identified as belonging to poor households were men. As shown in the graph, the fishing industry members are men between 26 and 55 years of age with primary education and in some cases with secondary and tertiary education.

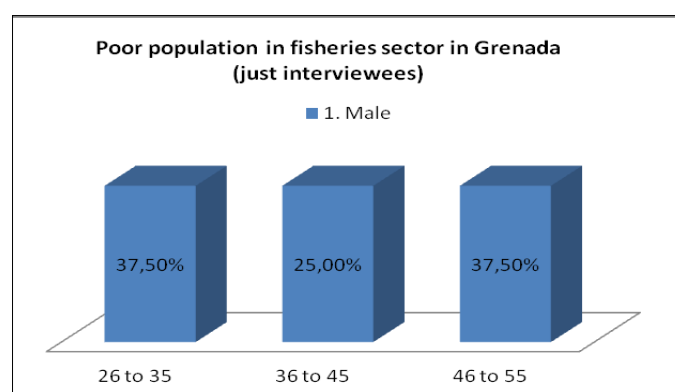


Figure 10: Poor population in fisheries sector in Granada (just interviewees)

87% are living in common-law relationships or are married, and the percentage of singles barely reaches 13%.

The average of members of a household is high, around 6.8. Houses are mainly composed by two heads of a family and in most cases more than 2 sons or daughters under 25 years old. According to the survey results, in these families there are no members aged over 55.

In **Guyana**, coinciding with Grenada, there were no women from the fishing industry whose home was considered poor. As shown in Figure 11, respondents are distributed in a pattern almost homogeneous between 26 and 55 years old. 90% of them are married or living in a common-law relationship and the rest are single or are widows / widowers.

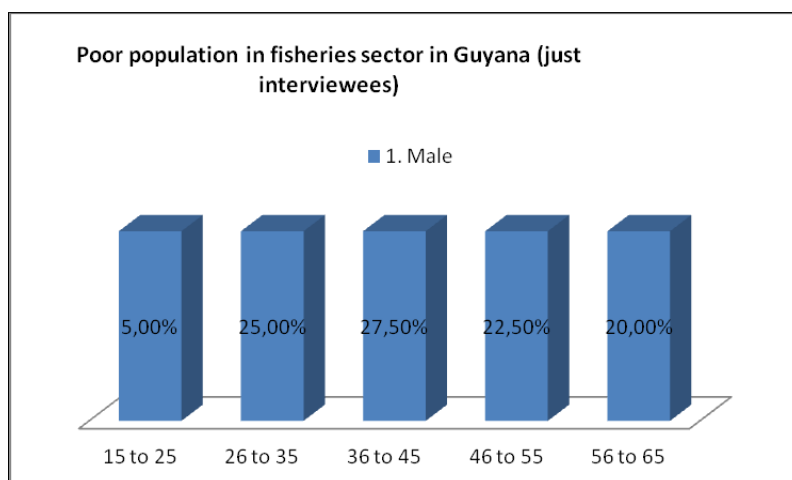


Figure 11: Poor population in fisheries sector in Guyana (just interviewees)

In Guyana, illiteracy and semi-literacy among the poor is also important as in Belize, 15% of respondents are illiterate and another 15% semi-literate.

Households are composed of 5.8 members on average of which 50.2% are women. Apparently in households with many members its structure consists of the two parents, their sons or daughters and in cases the in-law family.

In **Jamaica**, 1.85% of respondents whose households were considered poor were women. The bulks of interviewees were between 26 and 55 years old and were living in common-law relationships or married unions (Figure 12). 11% were single and 1.8% were separated.

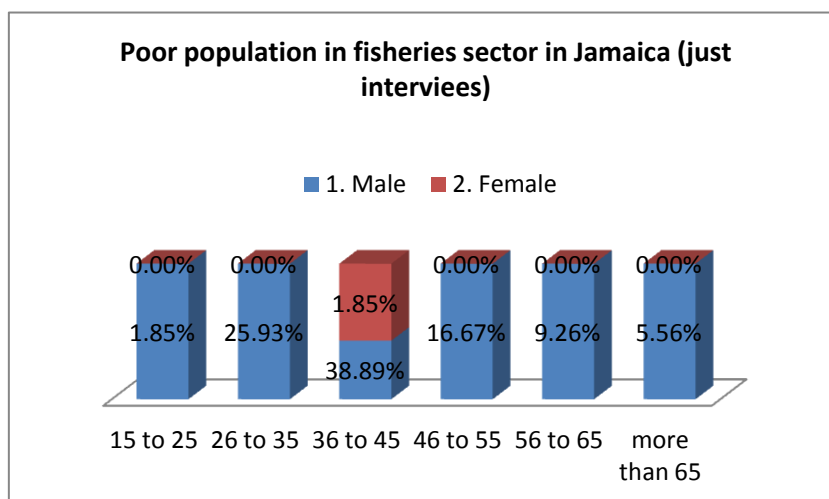


Figure 12: Poor population in fisheries sector in Jamaica (just interviewees)

In Jamaica, half of the interviewees had received a secondary education and almost all of the other half a primary one, with a small percentage (1.85%) of illiteracy. Household average

number of members is 5.7 and, as in all countries previously seen, the age structure of the home is pyramidal, being at the base the younger members, in all cases less than 15 years, and decreasing the number of members approaches the top, formed by older individuals.

In **Saint Vincent and the Grenadines** also all the respondents belonging to poor households are men between 26 to 65 years old but mainly between 36 and 45 years old (Figure 13). 75% of them are single and the rest are married, and all of them have received basic or primary education. Households are composed by an average of 4 members mainly headed by one or two members of the family with 2 or more children.

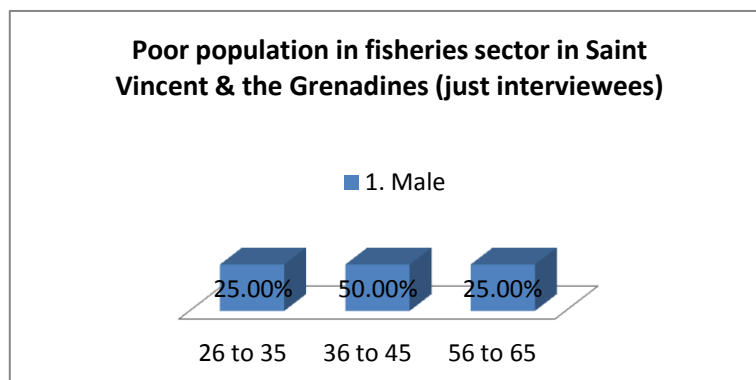


Figure 13: Poor population in fisheries sector in St. Vincent & the Grenadines (just interviewees)

In **Trinidad and Tobago** all respondents belonging to poor households are men between 26 and 35 years old; they live in common law unions and have attended primary or secondary education.

The average household had 6.5 family members. Considering the family ties among the household members, apparently its structure consists of the two parents, their sons or daughters and the in-law family.

Physical living conditions of the poor

The houses in which members of the fishing sector live, which are identified as poor, are undivided private houses owned by its inhabitants and in some cases are provided by the government. Walls are constructed primarily in wood or concrete blocks, with zinc sheeting roofs and floors made of wooden boards or cement.

In all countries studied except Guyana, Jamaica and Trinidad and Tobago, at least 83% of homes are owned by their inhabitants. In these three countries, although the percentage of owned houses is still the highest, provided houses also reach a significant proportion.

It has been observed that a certain percentage of the total studied population has no direct access at home to certain services, and to use them, they have to resort to their community or even have to look outside it. All these individuals have been identified within the extractive fishing sector. This content will be deepened in the "Living conditions" section.

In Belize, Guyana and Jamaica, the presence of houses built with inferior materials such as palm tree trunks, cardboard, earthen and waste materials have been observed. All low-quality

materials are used only in poor and vulnerable households, except those constructed on concrete floors that appear in all types of homes.

Almost every **Belizean** poor house built with inferior materials belongs to the aquaculture sector. 4% of poor houses have walls made of palm trees, and another 4.71% had floors made of soil. 8% of roofs are made of palm trees, while 4% are made of cardboard.

Households identified as vulnerable in Belize have varied building materials, compared with the poor ones, although principally walls are constructed of wood or cement blocks with zinc sheet or cement roofs and floors made of wooden boards or in some cases constructed of cement. Vulnerable households in the country may also have some material of low quality construction. 6.67% have earthen walls; 10% have ground floors and 6.6% have roofs constructed with cardboard and palm tree. The main part of Belizean vulnerable houses using low quality materials belongs to members of the capture fisheries sector.

The survey results show that 5.8% of the households surveyed in Belize, do not have direct access to running water in their homes and they have to resort to their community. In the region of Toledo, a small percentage of vulnerable households (1.68% of households from Belizean total sample) have to look for this resource outside their community.

In **Guyana**, 2.5% of poor houses have their walls made of palm trees. These houses belong to members of the extractive fishing sector. The rest of poor homes are built with similar materials to those described at the beginning of this section as the model of house belonging to poor members of the sector.

In East Berbice-Corentyne (Region 6), 0.6% of Guyana's households have to resort to their communities to have access to a shower or drainage system for sewage removal. All these households were identified as vulnerable.

Households identified as poor in **Jamaica** that use low quality materials belong to members of the capture fisheries sector. Low quality materials have only been found in wall construction, the other parts of the houses follows the standard defined at the beginning of this section. A 3.77% of houses use waste materials to build the walls and earth is used in 1.89% of cases. In Jamaican vulnerable houses there also is a small quantity of dwellings with walls made of waste materials, earth or palm trees.

This Study has identified Jamaica as the most difficult country for people to access more than one resource. Cases are found in all areas so that the problem cannot be restricted to one or more areas. It cannot only be restricted to poor and vulnerable as some non-poor households are also affected. All services studied affects between 6.10% and 16.18% of the population. This will be discussed in the section on "Living conditions".

7.2.3 Perception of economic situation of households

To assess the economic situation of poor households it is important to know the economic importance of fisheries in the home and other sources of income involved in sustaining the household. According to this study households that receive economic contributions from more than one sector are those that have more financial power.

Generally, a high dependency on fisheries incomes in poor households was observed. Poor households in Guyana and Trinidad and Tobago barely receive financial contributions from other sectors. Poor households of Belize are the only cases in which almost half the income is realized from sources other than the fisheries sector (Table 25).

Sources of household economy	Belize	Grenada	Guyana	Jamaica	Saint Vincent & the Grenadines	Trinidad & Tobago
FISHERY	53%	87%	99%	94%	88%	100%
Agriculture, cattle raising and forestry	12%	-	1%	1%	13%	-
Services (businesses, hotels, restaurants...)	-	-	-	2%	-	-
Civil Servant	-	4%	-	1%	-	-
Tourism	1%	-	-	-	-	-
Others	34%	-	1%	1%	-	-
Remittances	-	9%	0%	-	-	-
Total	100%	100%	100%	100%	100%	100%

Table 25: Sources of contribution in poor household's income.

The poor families detected in this study have a higher average of members per household than the average of the non-poor households that make up this study. Therefore, the income to sustain the household has to meet the needs of more people. When designing the Basic Need "Economic capacity" it was established that for it not to be considered unsatisfied, the average household income would cover US\$ 1500 per year for each household member.

The median income to cover expenses of each household member is higher than the US\$ 1,500 set in Belize, Grenada, Jamaica and Saint Vincent and the Grenadines but breaking down this data by region reveals significant differences between them. However, it is recalled that the economic criterion is one of the 4 criteria taken into account in deciding whether or not a household can be classified as poor. A family may have incomes above the limit set in this study and still have significant shortcomings in other aspects of their livelihood.

Table 26 shows the average of estimated income that could cover the expenses of each person living in households for each region. Communities in which the average household income does not cover the US\$1,500 needed per household member are highlighted in blue. All regions of Guyana and do not reach the US\$1.500 per person.

Country	Communities with poor homes	Estimated income \$/person year
Belize	Belize City	1,342.81
	Cayo	1,834.47
	Corozal	2,087.19
	Orange Walk	1,036.33
	Stann Creek	2,324.09
	Toledo	1,292.33
<i>Estimated income average in Belize</i>		<i>1,579.17</i>
Grenada	St John's	1,422.22
	St. Andrew's	2,259.55
	St. Patrick's	1,326.28
<i>Estimated income average in Grenada</i>		<i>1,655.66</i>
Guyana	Region # 2	1,116.14
	Region # 3	1,027.33
	Region # 4	1,074.08
	Region # 5	1,005.18
	Region # 6	801.57
<i>Estimated income average in Guyana</i>		<i>1,012.51</i>
Jamaica	Clarendon	4,028.07
	Hanover	764.05
	Kingston	2,395.50
	Manchester	1,502.57
	Portland	1,252.90
	Saint Andrew	1,090.78
	Saint Ann	1,277.68
	Saint Catherine	2,229.22
	Saint Elizabeth	1,192.32
	Saint James	1,286.75
	Saint Mary	1,243.92
	Saint Thomas	1,730.88
	Trelawny	2,016.49
	Westmoreland	703.77
<i>Estimated income average in Jamaica</i>		<i>1,577.61</i>
St Vincent & the Grenadines	Barrouallie	1,385.18
	Fitz Hughes	782.91
	Owia	2,711.11
<i>Estimated income average in St Kitts</i>		<i>1,511.45</i>
Trinidad & Tobago	St. Mary / North East	1,140.36
	St. Patrick	902.26
<i>Estimated income average in Trinidad & Tobago</i>		<i>1,012.15</i>

Table 26: Sources of estimated income in US\$ to cover expenses of each member of poor households' studied

Household income do not have to imply a strong or weak family economy, it sometimes depends on the household's extra costs, whether at the level of acquisition of desirable goods, leisure and holidays, sickness expenses, or to recover from the effect of any environmental threat. However, low income households in which expenses are tightly controlled, can balance income with outgoings and may even save money. This is supported by the data obtained in the Study.

In almost all countries it has been found that more than 50% of vulnerable and poor households are able to save money or at least to match income with expenses. There are three exceptions Grenada, Montserrat and Saint Vincent and the Grenadines. In the first case, only 30% of respondents belonging to vulnerable or poor homes do manage to make some savings or balance their incomes throughout the year. In Montserrat, no vulnerable household manage to save money and only 33% of them can balance the incomes with the outgoings. In Saint Vincent and the Grenadines all poor households must resort to their savings to make ends meet.

As shown in table 27, in general terms in all countries except Grenada, Jamaica and Saint Vincent and the Grenadines at least half of households considered poor are able to save or at least manage to offset expenses with their income.

Trinidad and Tobago, Grenada, Jamaica, Guyana and Belize are the only countries in which some poor households are forced into debt. As seen in the table below these proportions of households in debt seems to be bigger in Trinidad and Tobago, but is also true that the proportion of poor households in this country is only 1.32%.

Grenada, Jamaica and Saint Vincent and the Grenadines are the countries in which poor households have more problems in making ends meet and they need to resort to their savings or are even forced into debt. Surprisingly, in Belize and Guyana, which are the countries with the highest percentage of poor, most poor households manage to make ends meet; balancing the costs to revenues and even in Guyana 47% of households are able to save money.

	BELIZE	GREN	GUYANA	JAMAICA	SAINT VINCENT & THE GREN	TRIN & TOBAGO
Manage to save money	6.67%	12.50%	47.50%	5.56%	0%	50%
Can just about balance your income and outgoings	86.67%	0%	32.50%	35.19%	0%	0%
Are forced to spend savings	6.67%	62.50%	7.50%	44.44%	100%	0%
Are forced into debt	0%	25%	12.50%	14.81%	0%	50%
TOTAL % OF POOR HOUSEHOLDS IN COUNTRY	25.64%	6.61%	21.82%	11.46%	5.41%	1.32%

Table 27: Ability of making savings or indebtedness of poor households in the fishing sector

8. Description of social and economic status in Fishing Communities of the CARICOM Region

8.1 An overview of the fisher's way of life

8.1.1 Description of the sample studied

This report is based on the results analysis of the fisherman survey's fieldwork carried out from May 2010 to May 2011.

The **Bahamas** survey took place on the islands with highest levels of fishing activity, but above all in Abaco, North Andros and Grand Bahama.

98.99% of fishers interviewed in Bahamas were men. In this profession, the bulk of the age distribution is concentrated among those aged between 36 and 55 years. Considering the results of this Study, in the new generations, apparently fewer and fewer are getting involved in the fishing sector (Figure 14).

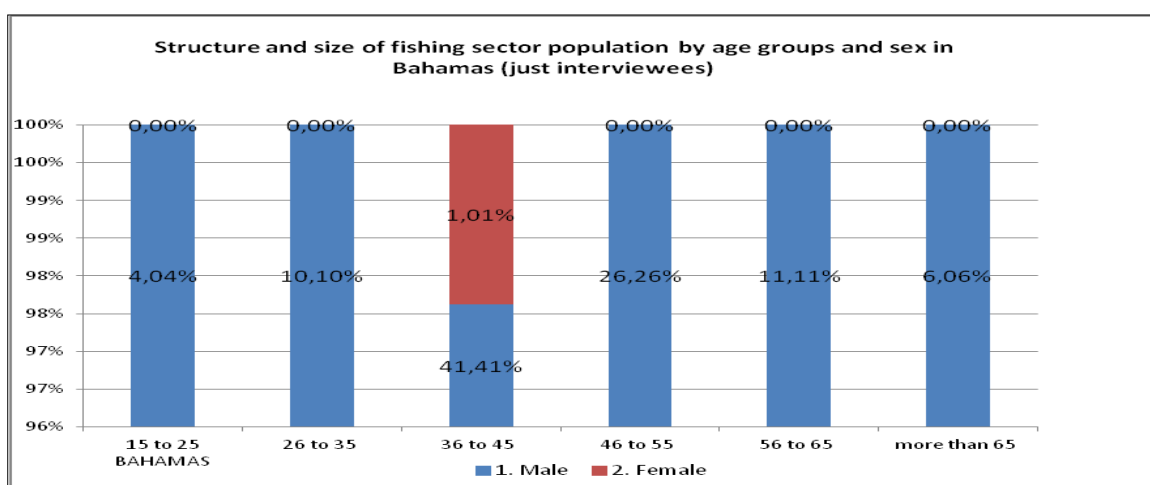


Figure 14: Structure and size of fishing sector population by age groups and sex in Bahamas (just interviewees)

In general terms 68.69% of respondents are married and 23.23% are single. The percentage of separated and divorced barely exceeds 5% of respondents. According to this Study, Bahamian fishermen's households are made up 60% by men and 40% by women. 47.17% of household members are aged between 36 and 55 years, but there is a significant component of household members under 35 years of age (Figure 15).

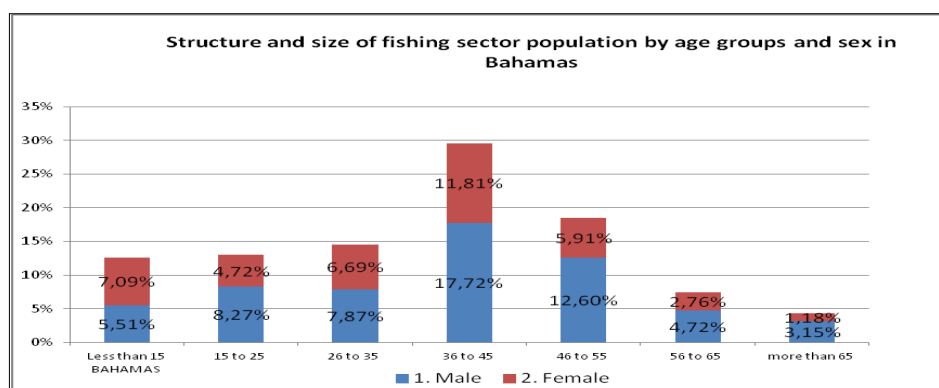
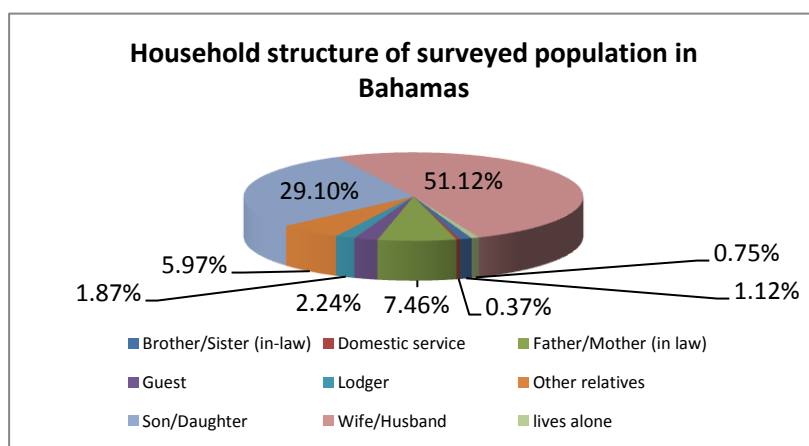
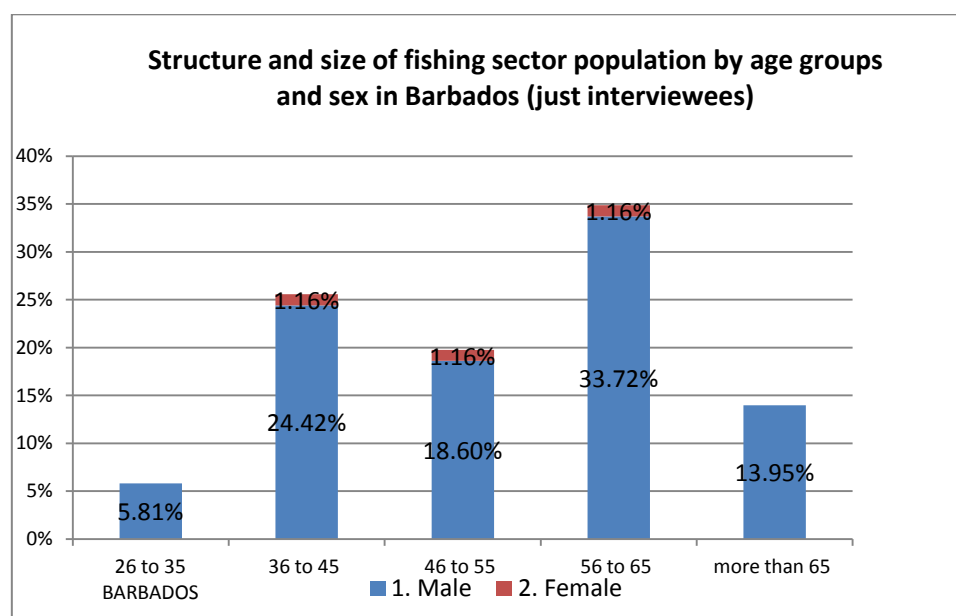


Figure 15: Structure and size of fishing sector population by age groups and sex in Bahamas

Of the fishers interviewed, 85.8 per cent were one of the heads of the family. The average number of members making up a household is 2.57 people. Households are mainly structured on the mainstay of 2 parents –wife/husband and in some cases father/mother (in-law) – and a child (son/daughter). In-law family; other relatives; domestic service providers; lodgers and guests constitute the remaining types of household members (Figure 16).

**Figure 16: Household structure of surveyed population in Bahamas**

The **Barbados** survey took place in all parishes except Saint Andrew. The highest numbers of fishermen interviewed were in Christchurch, Saint Michael and Saint Philip. In Barbados, 96.51% of fishermen interviewed were men. In this profession, the bulk of the age distribution is concentrated among those aged between 36 and 65 years, with those between 56 and 65 years of age representing 34.8% of those interviewed. According to the results of this Study, in the new generations, apparently fewer and fewer are getting involved in the fishing sector. (Figure 17)

**Figure 17: Structure and size of fishing sector population by age groups and sex in Barbados (just interviewee)**

In general terms 62.33% of respondents are married or in common-law unions; and the proportion of singles reached 39.53%. The percentage of separated and divorce represents 8%

of respondents. According to this Study, Barbadian fishermen's households are made up 58.25% by men and 41.75% by women. As was seen in the section on the demographic characteristics of the CARICOM countries, the results of this Study indicate that Barbados is one of the countries with the highest aging population of the region, with fishermen's households made up only by 3.6% of individuals under 15 years old (Figure 18).

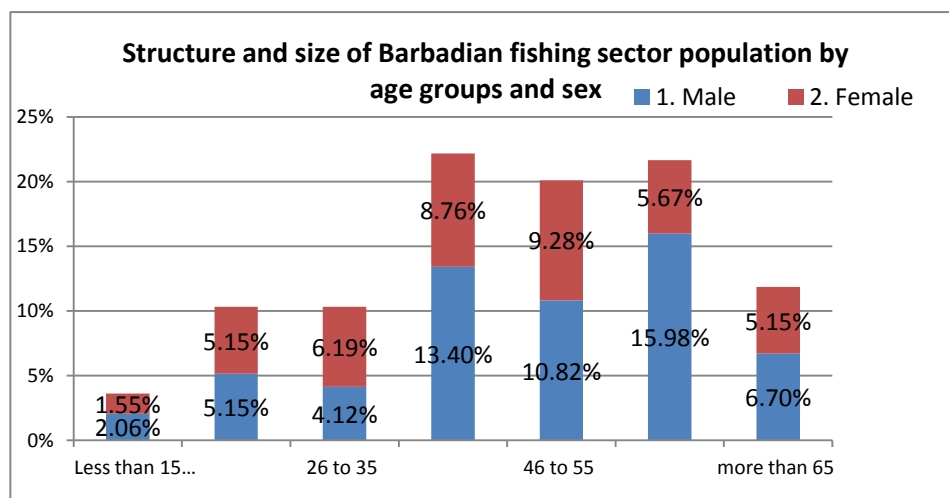


Figure 18: Structure and size of Barbadian fishing sector population by age groups and sex

66.28% of fishers interviewed were one of the heads of the family, and 17.44% lived alone. The average number of members making up a fisherman's household is 2.3 people. Households are mainly structured on the mainstay of 2 parents – wife/husband and in some cases father/mother (in-law) – and a child (son/daughter). In-law family; other relatives; lodgers and tenants make up the remaining types of household members (Figure 19).

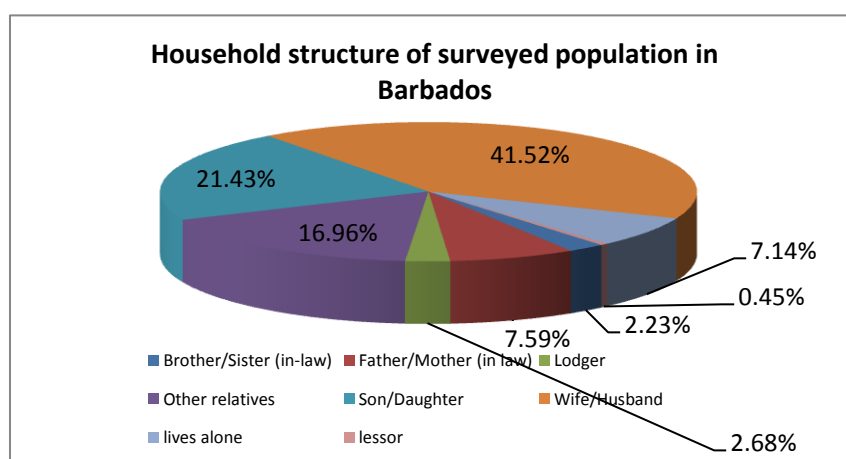


Figure 19: Household structure of surveyed population in Barbados

Belizean fishermen household surveys took place just in the coastal districts; the ones with the highest numbers of interviewees were the southernmost ones - Stann Creek and Toledo.

Of the surveyed countries, **Belize** had the largest number of women interviewed in the extractive fishing sector (8.86%). Half of the individuals interviewed were between 26 and 45 years old. This country, in comparison to the other countries analyzed, has a remarkable percentage of fishermen between 15 and 25 years of age (12.66%) (Figure 20).

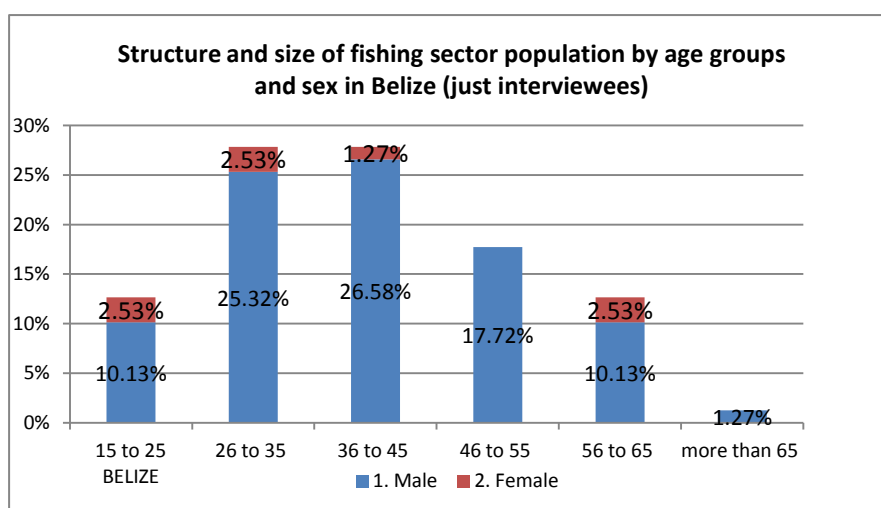


Figure 20. Structure and size of fishing sector population by age groups and sex in Belize (just interviewees)

In general terms, 83.55% of respondents are married or in common-law unions, there are 12.66% of singles and just 3.8% of divorced or separated people. According to this Study, Belizean fishermen's households are made up 53.33% by men and 46.67% by women. As was seen in the section on the demographic characteristics of the CARICOM countries, the results of this Study indicate that Belize is one of the countries with the youngest population of the region, with fishermen's households made up of 35.94% of individuals under 15 years old (Figure 21).

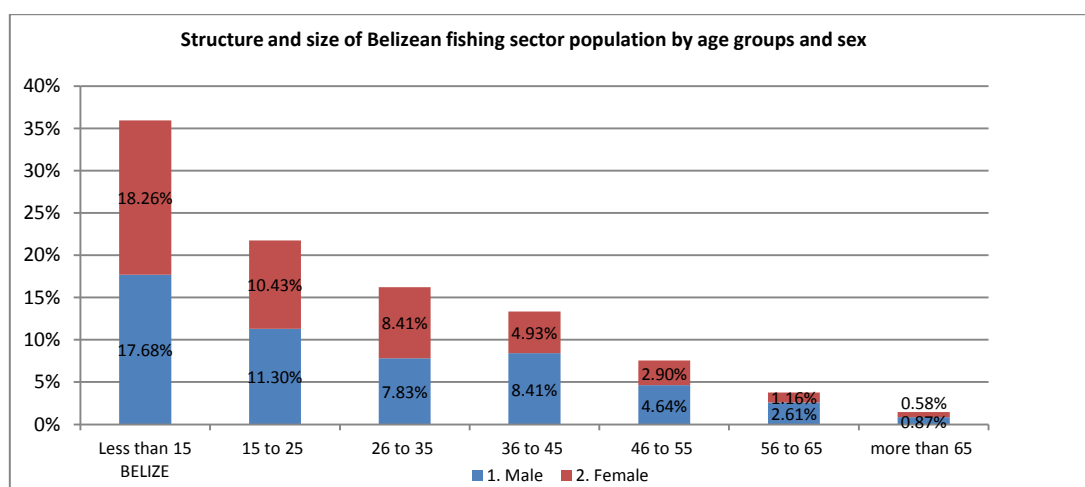


Figure 21. Structure and size of Belizean fishing sector population by age groups and sex

Of the fishers interviewed, 93.67 per cent were one of the heads of the family. The average number of members making up a fisherman's household is 4.37 people. Households are mainly structured on the mainstay of 2 parents – wife / husband – and more than two children (son / daughter). Other relatives; in-law family; guests; domestic service providers and lodgers make up the remaining types of household members.

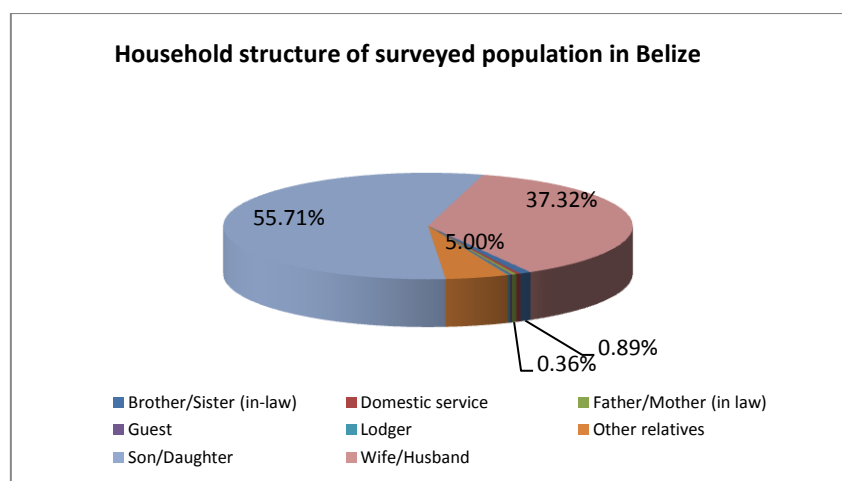


Figure 22: Household structure of surveyed population in Belize

In **Grenada** all parishes were surveyed including Carriacou and Petite Martinique; islands belonging to the Grenadines that have a status of dependency. The parish with the highest number of respondents was Saint Andrew; and only two fishermen were interviewed in Saint David.

97.48% of fishermen interviewed in Grenada were men. In this profession, the bulk of the age distribution is concentrated among those aged between 26 and 55 years. The ones aged between 36 and 45 years represent 33.61% of interviewees. It is noteworthy that there is a small representation of fishers under 15 years old (Figure 23).

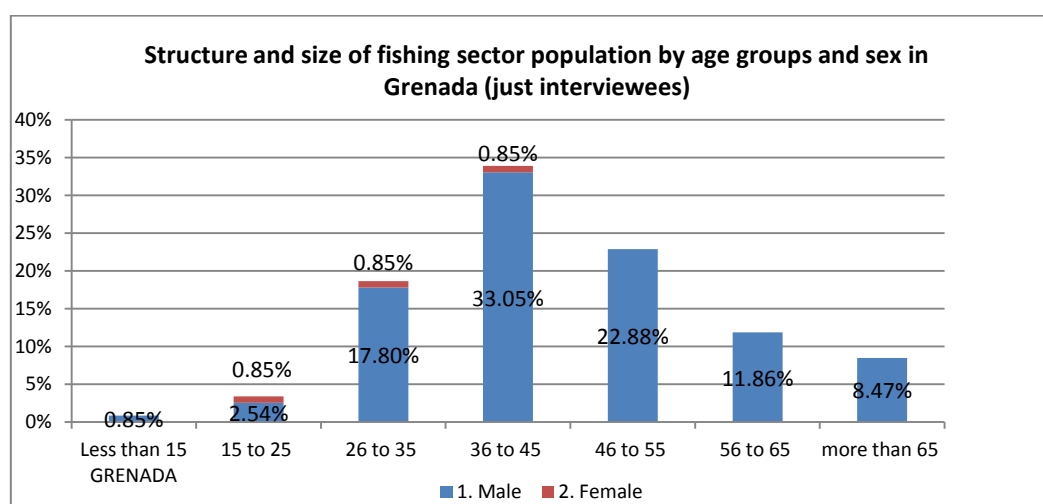


Figure 23: Structure and size of fishing sector population by age groups and sex in Grenada (just interviewees)

In general terms, 51.69% of respondents are married or in common-law unions; and the proportion of singles reaches 44.92%. The percentage of separated and divorced is less than 2%. According to this Study and as shown in Figure 24, Grenadian fishermen's households are made up 58.77% by men and 41.23% by women. Grenada is another country with a high proportion of young household members; members under 15 years of age represent 21.56% of the total household members.

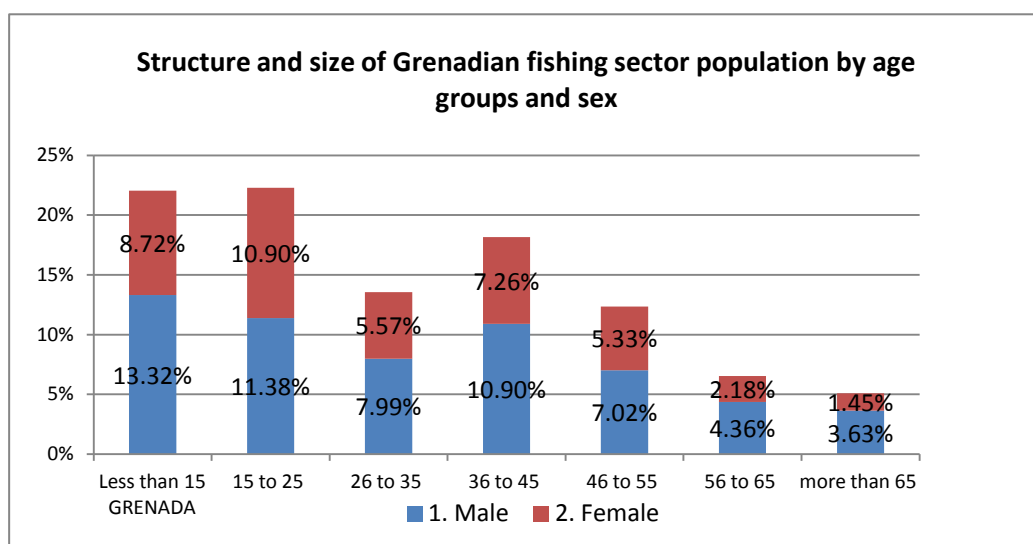


Figure 24: Structure and size of Grenadian fishing sector population by age groups and sex

75% of fishers interviewed were one of the heads of the family and 2.54% lived alone. The average number of members making up a fisherman household is 3.58 people. Households are mainly structured on the mainstay of 2 parents – wife / husband and in some cases Father / Mother (in law) – and more than two children (Son / Daughter). Other relatives; in-law family; guests and lodgers make up the remaining types of household members (Figure 25).

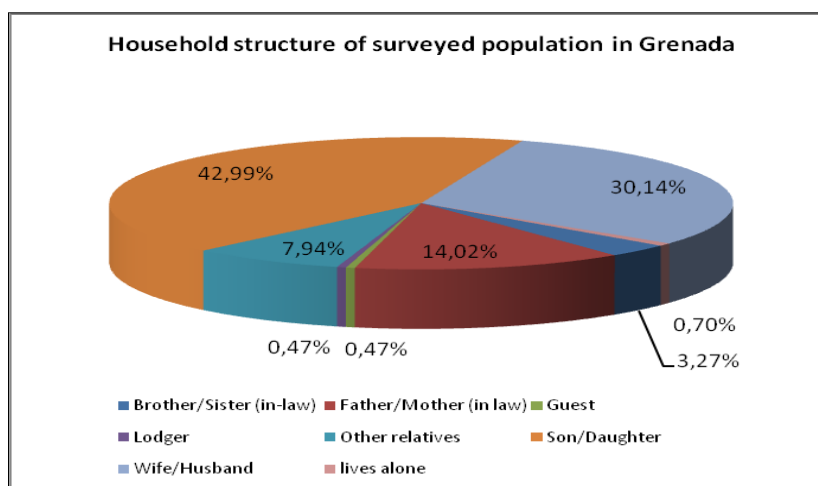


Figure 25: Household structure of surveyed population in Grenada

Guyana's interviews were carried out just in coastal regions except Barima; the regions with the highest number of respondents were Essequibo Islands -West Demerara and Demerara-Mahaica.

95.56% of fishermen interviewed in Guyana were men. In this profession, the bulk of the age distribution is concentrated among those aged between 36 and 55 years. The ones aged between 36 and 45 years represent 40% of those interviewed. According to the results of this Study, in the new generations, apparently fewer and fewer are getting involved in the fishing sector (Figure 26).

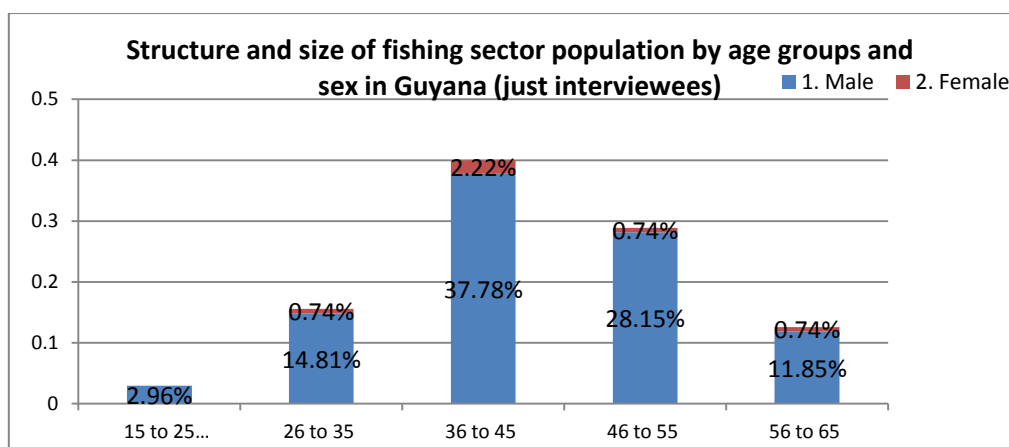


Figure 26: Structure and size of fishing sector population by age groups and sex in Guyana (just interviewees)

In general terms, 89.63% of respondents are married or in a common-law union. According to this Study, the Guyana fishermen's households are made up 51.04% by men and 48.96% by women. Guyana is another country with a high proportion of young household members; members under 15 years of age represent 23.36% of the total household members (Figure 27).

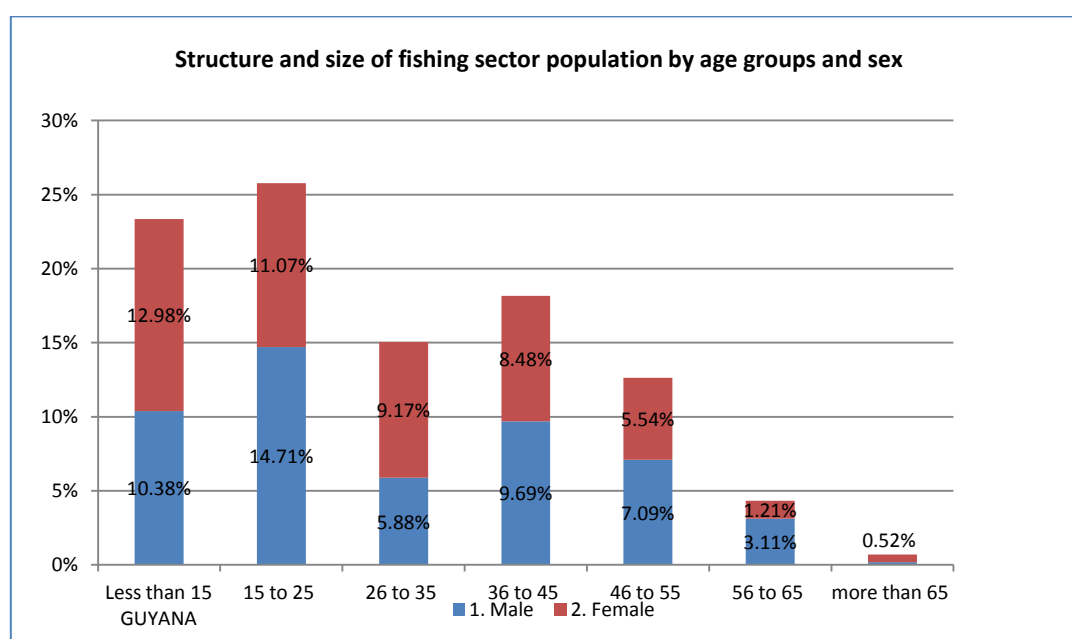


Figure 27: Structure and size of fishing sector population by age groups and sex in Guyana

96.3% of fishers interviewed were one of the heads of the family. The average number of members making up a fisherman household is 4.37 people. Households are mainly structured on the mainstay of 2 parents – wife/husband and in some cases father/mother (in law) – and two children (son/daughter). Other relatives; in-law family; domestic service providers and lodgers make up the remaining types of household members (Figure 28).

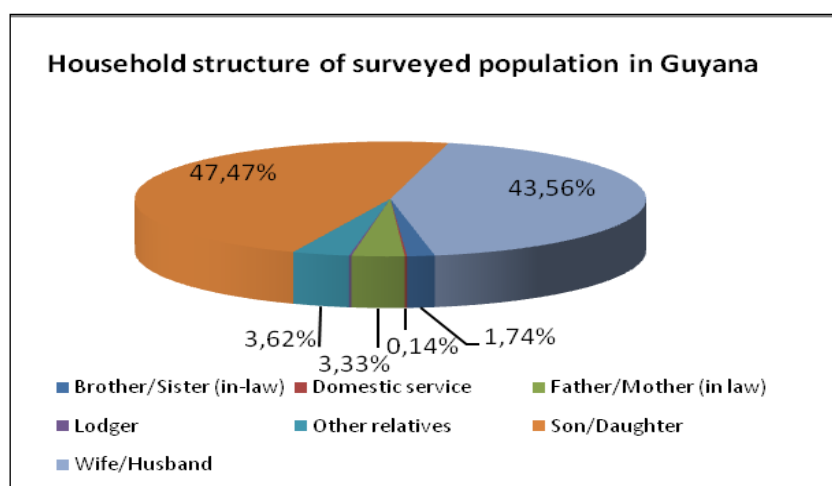


Figure 28: Household structure of surveyed population in Guyana

The **Jamaican** survey process took place in all parishes with Saint Catherine being the one with the highest number of respondents.

98.48% of fishermen interviewed in Jamaica were men. In this profession, the bulk of the age distribution is concentrated among those aged between 36 and 55 years. Fishermen between 26 and 35 years of age are also representative (19.39%). According to the results of this Study, in the new generations, apparently fewer and fewer are getting involved in the fishing sector (Figure 29).

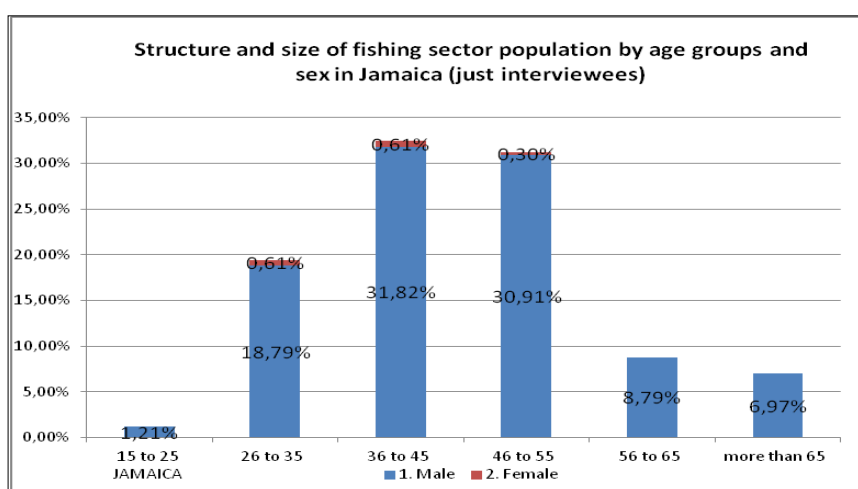


Figure 29: Structure and size of fishing sector population by age groups and sex in Jamaica (just interviewees)

In general terms 65.15% of respondents are married or in a common-law union, and 33% are single. According to this Study, Jamaican fishermen's households are made up 57.48% by men and 42.52% by women. As was seen in the section on the demographic characteristics of the CARICOM countries, the results of this Study indicate that Jamaica is one of the countries with the youngest population of the region, with fishermen's households made up 30.25% by individuals under 15 years old (Figure 30).

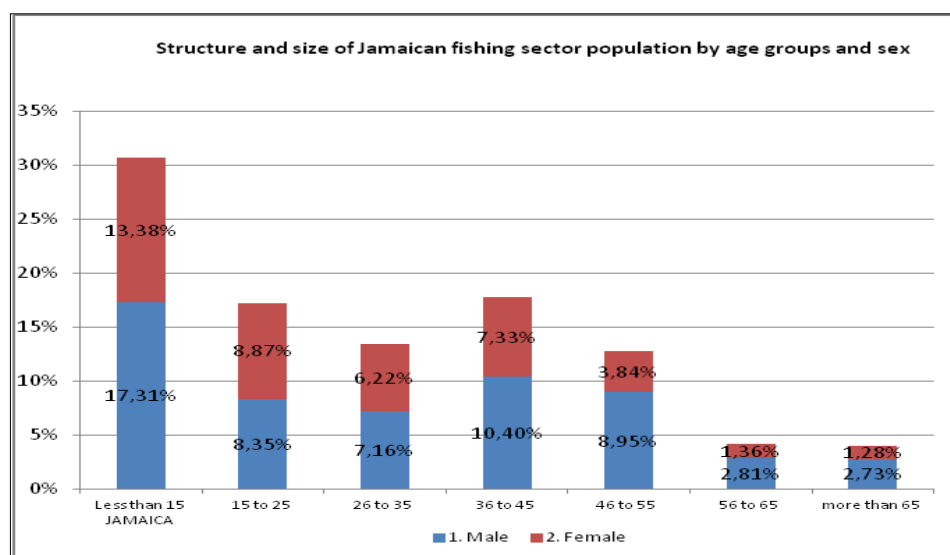


Figure 30: Structure and size of Jamaican fishing sector population by age groups and sex

91.21% of fishers interviewed were one of the heads of the family, and 3.03% lived alone. The average number of members making up a fisherman household is 3.63 people. Households are mainly structured on the mainstay of 2 parents – wife / husband and in some cases father / mother (in law) – and in most cases more than 1 child (son / daughter). Other relatives; in-law family; domestic service providers; guests and lodgers make up the remaining types of household members.

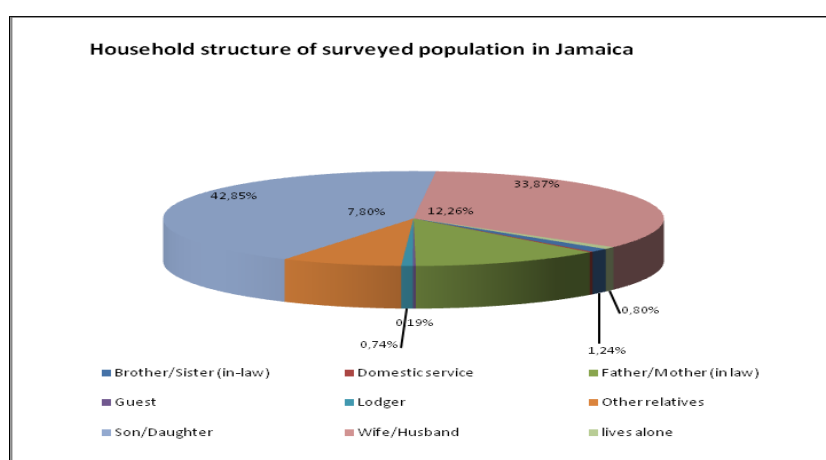


Figure 31: Household structure of surveyed population in Jamaica

In **Montserrat** surveys were done in the west and northwest part of the island, where the fishery industry is developed.

Of the fishers interviewed in Montserrat 93.18% were men. In this profession, the bulk of the age distribution is concentrated among those aged between 36 and 65 years. The ones between 56 and 65 years of age represent the 34.09% of those interviewed. According to the results of this Study, in the new generations, apparently fewer and fewer are getting involved in the fishing sector. Fishermen below 35 years of age are represented by just 2.27% of the interviewees. Among all the countries participating in this Study, Montserrat is the country with the highest percentage of active fishermen aged over 65 years old (Figure 32).

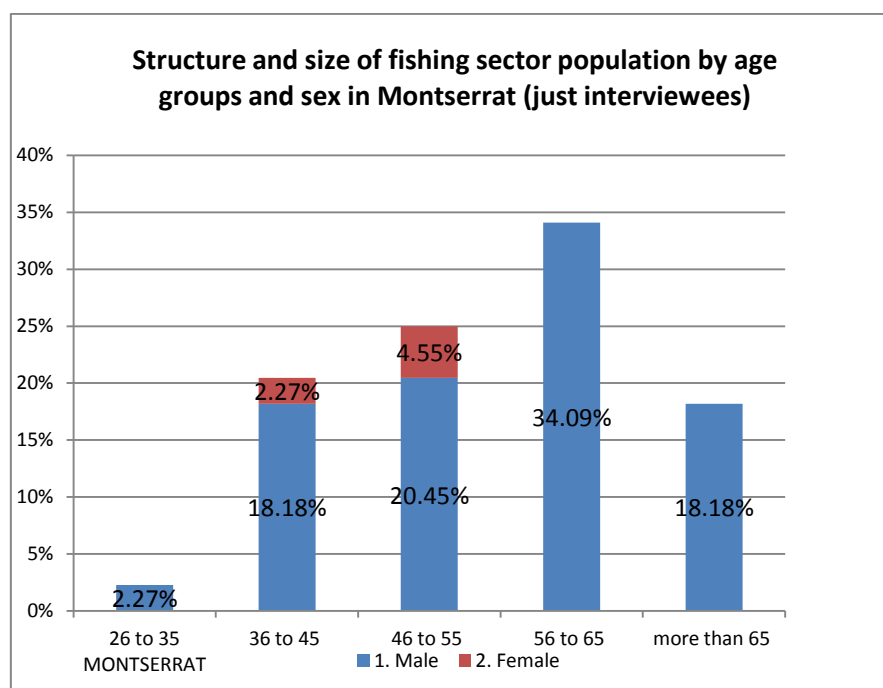


Figure 32: Structure and size of fishing sector population by age groups and sex in Montserrat (just interviewees)

In terms of civil status of respondents, the percentage of single fishermen is remarkable (43.18%), especially considering that most respondents are aged over 36. According to this Study, fishermen's households in Montserrat are made up 57.48% by men and 42.52% by women. The figure "Structure and size of fishing sector population by age groups and sex in Montserrat", draws attention to the low percentage of household members belonging to the 26 to 35 year age range; it is also remarkable that this range is made up mainly of women (Figure 33).

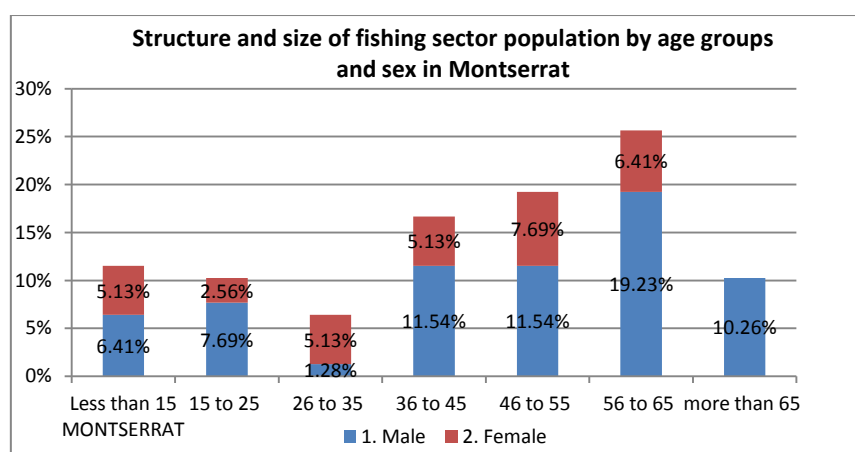


Figure 33: Structure and size of fishing sector population by age groups and sex in Montserrat

95.45% of fishers interviewed were one of the heads of the family, while the remaining 5.45% were lodgers in the house in which they live. The average number of members making up a fisherman's household is 1.93 people. Households are composed mainly by one or two heads of family (wife / husband) and in some cases by a child (Figure 34).

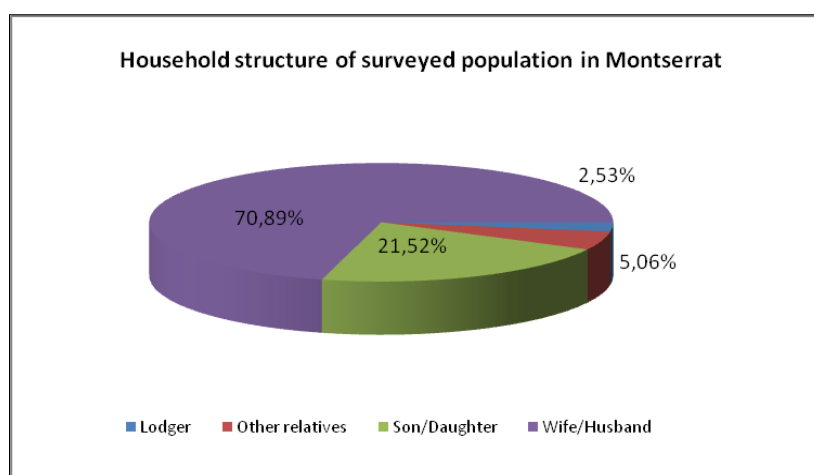


Figure 34: Household structure of surveyed population in Montserrat

In **Saint Kitts and Nevis** both islands were surveyed; the parishes with the highest number of respondents were Saint George in Saint Kitts; and Saint James and Saint Thomas in Nevis. 94.03% of fishermen interviewed in Saint Kitts and Nevis were men. In this profession, the bulk of the age distribution is concentrated among those aged between 26 and 55 years. Fishermen aged over 56 are also represented (Figure 35).

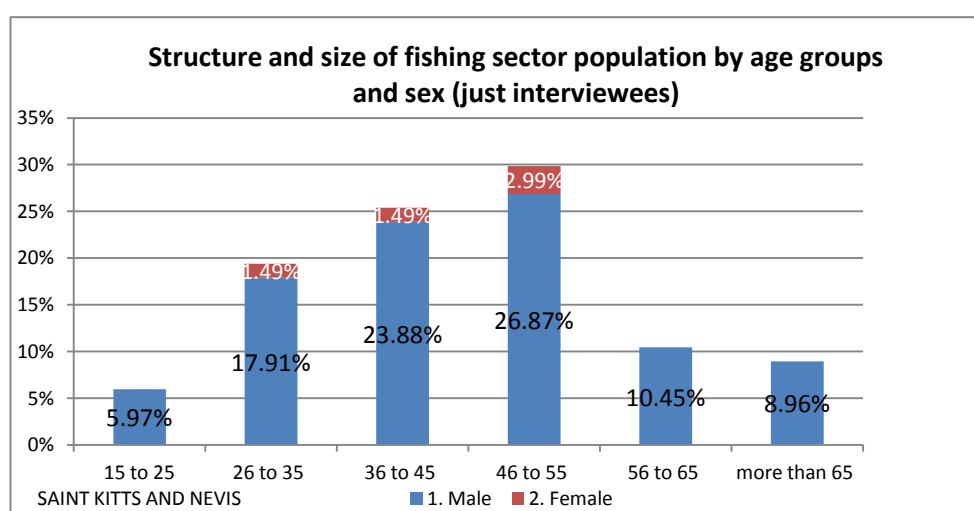


Figure 35: Structure and size of fishing sector population by age groups and sex (just interviewees)

In terms of civil status of respondents, in Saint Kitts and Nevis the percentage of singles is quite remarkable (38.81%), especially among the 46 to 55 year age group. According to this Study, fishermen's households in Saint Kitts and Nevis are made up 54.71% by men and 45.29% by women. In the structure of households in Saint Kitts and Nevis, the percentage of individuals by age group is quite homogeneous, especially for those under 55 years of age. Also noteworthy is the percentage of household members aged over 65, one of the highest of all countries studied (Figure 36).

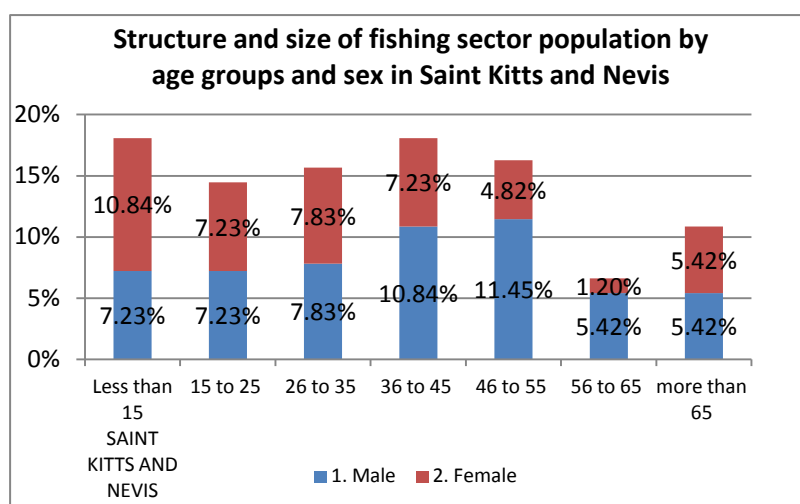


Figure 36: Structure and size of fishing sector population by age groups and sex in Saint Kitts and Nevis

58% of fishers interviewed were one of the heads of the family and 22.39% of fishermen interviewed lived alone. The average number of members making up a fisherman household is 2.58 people. Households are composed mainly of one or two heads of family – (wife / husband) or in some cases father / mother (in law) - and one or two children. In-law family and other relatives make up the remaining types of household members (Figure 37).

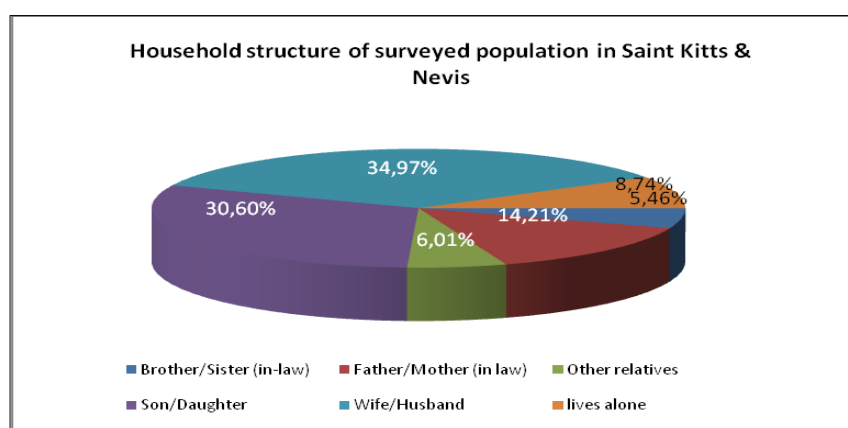


Figure 37. Household structure of surveyed population in Saint Kitts & Nevis

In **Saint Vincent and the Grenadines**, the survey process took place in all parishes; Saint George and the Grenadines were the ones with the highest number of respondents.

96% of fishers interviewed in Saint Vincent and the Grenadines were men. In this profession, the bulk of the age distribution is concentrated among those aged between 36 and 65 years, but also fishermen aged between 26 and 35 and those over 65 years play an important role in the fisheries sector. In this case, the tendency can also be seen for the young to seek jobs other than those related to fishing.

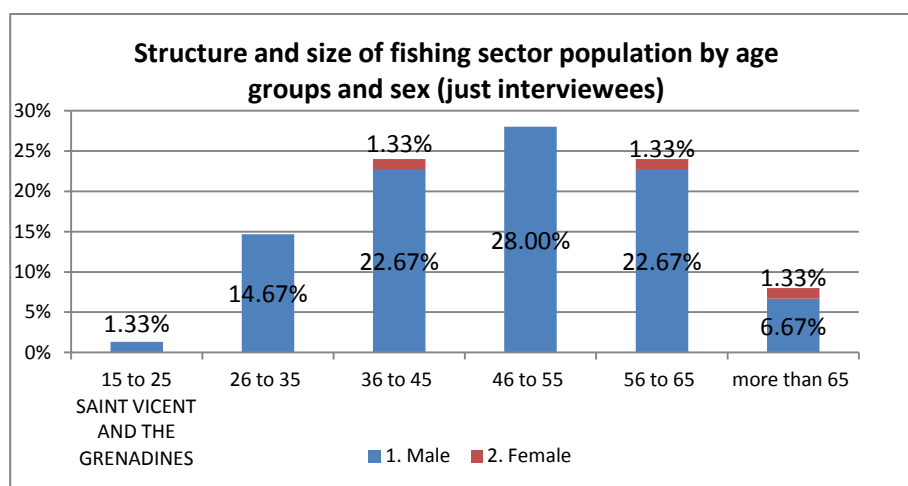


Figure 38. Structure and size of fishing sector population by age groups and sex in St Vincent and the Grenadines (just interviewees)

According to this Study, fishermen's households in Saint Vincent and the Grenadines are made up 57.78% by men and 42.22% by women. This is one of the countries with a high proportion of young household members; members under 15 years of age represent 23.89% of total household members.

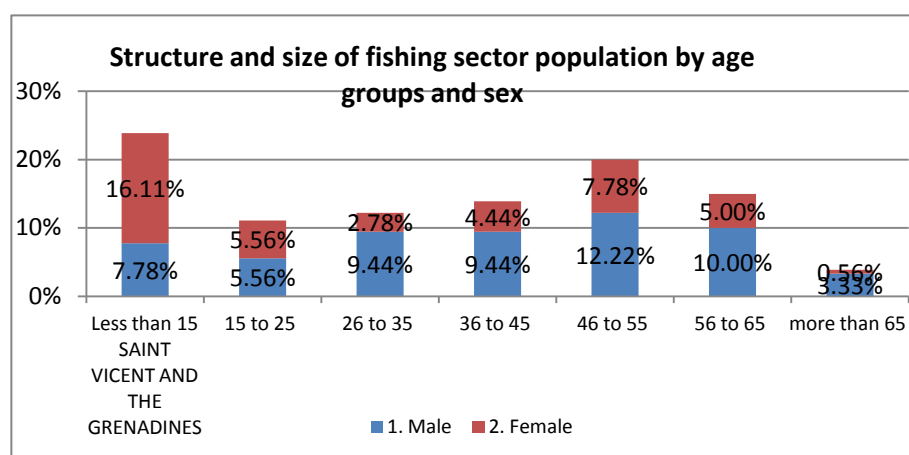


Figure 39: Structure and size of fishing sector population by age groups and sex in St. Vincent and the Grenadines

81% of fishers interviewed were one of the heads of the family. The average number of members making up a fisherman household is 2.50 people. Households are composed mainly of one or two heads of family – (wife/ husband) or in some cases father/mother (in law) - and one or two children. In-law family and other relatives make up the remaining types of household members.

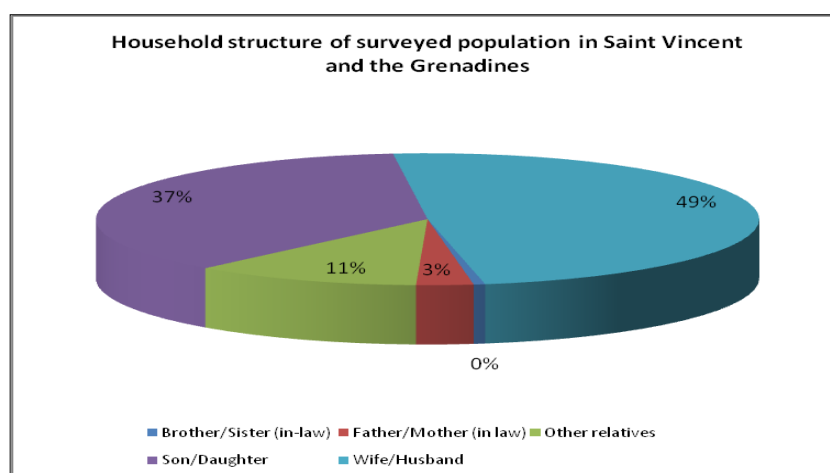


Figure 40: Household structure of surveyed population in Saint Vincent and the Grenadines

In **Trinidad and Tobago** the survey process took place in all countries.

95% of fishers interviewed in Trinidad and Tobago were men. In this profession, the bulk of the age distribution is concentrated among those aged between 26 and 45 years, but also fishermen aged between 46 and 65 plays an important role in the fisheries sector. In this case, the tendency can also be seen for the young to seek jobs other than those related to fishing (Figure 41).

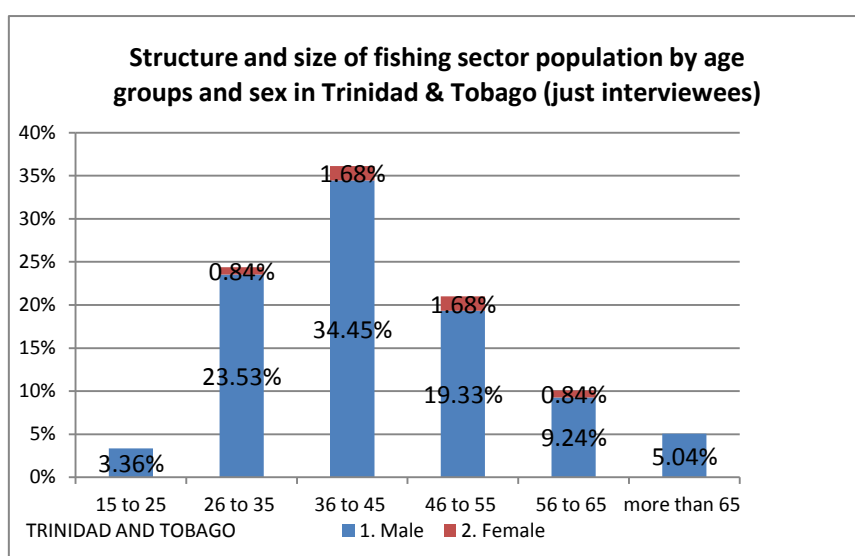


Figure 41: Structure and size of fishing sector population by age groups and sex in Trinidad & Tobago (just interviewees)

According to this Study, fishermen's households in Trinidad and Tobago are made up 60.75% by men and 39.25% by women. In the structure of households, the percentage of individuals by age group is quite homogeneous, especially for those under 45 years of age (Figure 42).

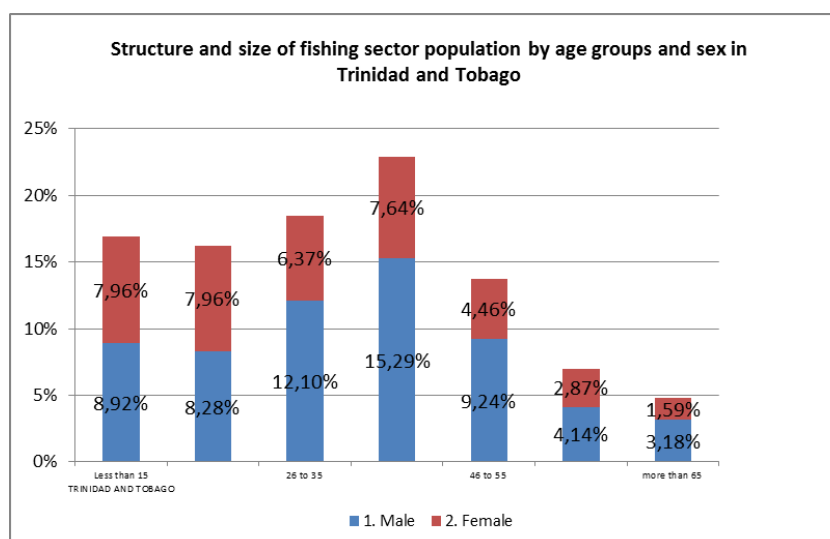


Figure 42: Structure and size of fishing sector population by age groups and sex in Trinidad and Tobago

79.83% of fishers interviewed were one of the heads of the family. The average number of members making up a fisherman household is 2.64 people. Households are composed mainly of two heads of family – (wife/ husband) or in some cases father/mother (in law) and a child. In-law family and other relatives make up the remaining types of household members (Figure 43).

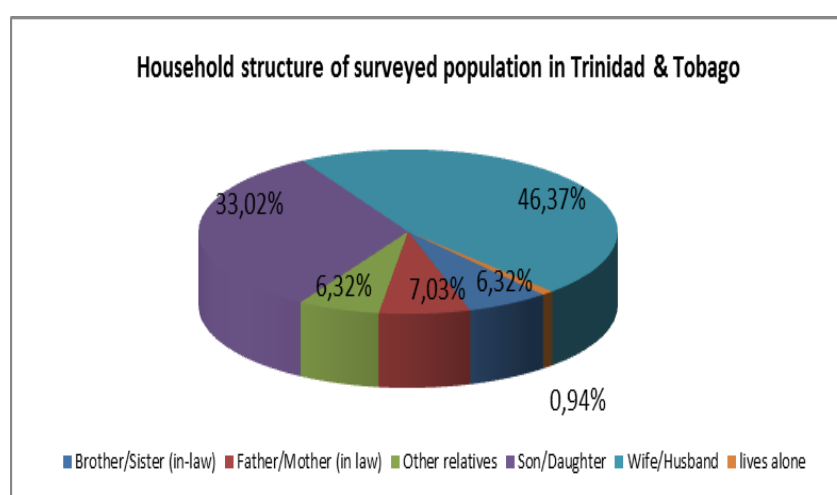


Figure 43: Household structure of surveyed population in Trinidad and Tobago

More than 84% of interviewees were living in the country where they were born. Saint Kitts and Nevis with 90% of national interviewees has fishing sector participants from EU countries such as Germany and UK; and people from other Caribbean countries such as Guyana and Dominican Republic. 5% of Belize respondents were from Guatemala and Taiwan.

In each country at least 93% of fishermen interviewed were male: Belize, Montserrat, Saint Kitts and Nevis, and Trinidad and Tobago are the countries with the highest proportion of women working in the sector.

In general terms, in all countries the average age of more than half of fishermen is between 36 and 55 years, except in Belize and Trinidad and Tobago, where it is between 26 and 45

years. Countries such as Montserrat, Barbados and Saint Vincent and the Grenadines have a significant component of fishers aged between 56 and 65 years.

73.8% of the interviewees were boat owners, 6% were either boat agents or were renting the craft used in their fishing activities and the rest of the respondents were crew members. It must also be said that most boat owners are also engaged in fishing activities as part of the crew. Guyana and Bahamas are the countries with the highest percentage of craft owners, whereas in Barbados they slightly exceed half the sample in percentage.

According to the answers to the questions, in general terms, the interviewees have around 24 years of working experience in the sector. Montserrat participants are the ones with the most years of dedication to the fishery sector, 35 years on average, compared to those of Belize and Guyana who do not reach 20 years of dedication.

8.1.2 Fishing activity

Fishing activity is an important component for the development of Caribbean countries. In some cases fishery resources are in-demand by countries outside the region and so have an important influence in country economy; in other cases, fishing has a subsistence component and so becoming a source of income and food to strengthen family finances.

Artisanal fishing is the most widespread fishing operation in CRFM Member States. Artisanal fishing does not have to correspond to a source of low income; some species such as Spiny Lobster (*Panulirus argus*), captured in an artisanal way, carries a high value either on the national or international market.

Industrial fishing is not developed in all countries; it is mainly practiced in **Bahamas, Barbados, Belize, Guyana, Jamaica and Trinidad and Tobago**. In general terms, it focuses on the capture of shrimp, conch and fin-fish. Guyana and Trinidad and Tobago have a specialized fleet of trawlers licensed to catch either large Penaeid shrimp or seabob (*Xiphopenaeus kroyeri*). These trawlers measure about 21 m in length and use double outrigger shrimp trawl nets with TEDs and operate in waters 14 - 91 m in depth over the seabed of mud, gravel or sand. In **Trinidad and Tobago** there is also a multi-gear semi-industrial fleet consisting of vessels of 14-26 metres in length primarily fishing pelagic fish and demersal species using longlines and fish pots and staying at sea from 7 to 15 days.

Artisanal fishing in the region usually takes place in coastal areas of the continental shelf, mainly in reef banks, but pelagic fishing also takes place offshore.

A major artisanal fishery has developed around Spiny lobster (*Panulirus argus*). In countries such as Bahamas it constitutes the foundation of its fishing industry; being the target of 95% of fishers. Lobster has a major influence in the economy of Bahamas, Belize, Grenada, Jamaica, Saint Vincent and the Grenadines, and with less importance in Barbados. The usual trend is the export of lobster tails. In The Bahamas exports reach up to 90% of total landings, but there is also a local market stimulated by tourist demand, major markets of locally consumed products being restaurants, hotels and home consumption. Capture can be performed either with gear like traps and casitas (condominiums in Bahamas) and through free diving using hooksticks, and in some cases Hawaiian sling.

A fleet, specialized in lobster fishing, consists of open boats between 4.3 - 7.6 metres in length made of fibreglass or wood and propelled by outboard motors, primarily for lobster trapping. In Belize sail sloops up to 10 metres in length made mostly of wood and equipped with sails and smaller auxiliary outboard motors, are used primarily for free diving for lobster, conch and occasionally finfish. In The Bahamas and Jamaica, at least 93% of boats used for this purpose are made of fibreglass, whereas in Belize, Grenada and Saint Vincent and the Grenadines the proportion between wooden crafts and fibreglass is nearly the same.

Queen conch (*Strombus gigas*) is also a major pillar of the fishing industry in Bahamas; Belize; Grenada; Jamaica; Saint Kitts and Nevis and Saint Vincent and the Grenadines, achieving high market prices. In Belize, conch is the second most productive wild catch fishery, and it can only be collected by free diving; in The Bahamas it is the second in terms of value and the third in terms of weight. Conch is mostly consumed locally, although significant exports also take place. In some countries, a local market has been developed for conch shell jewellery and artwork, with conch in Barbados being mainly used for this purpose. A fleet specialized in conch fishery is the same as a lobster fleet, open boats of between 4 and 7 metres powered by 40-65hp engines. In Belize sloops are also used.

According to the results of the survey, Bahamas also has an important market for sea-cucumber (*Holothuria mexicana*); cushioned star (*Oreaster reticulatus*) and Stone crab (*Menippe mercenaria*), all of them achieving high prices in first and second sale. Stone crab and blue crab (*Callinectes sapidus*) are exploited resources in Barbados, Belize, Jamaica and Trinidad and Tobago.

Finfish fisheries make a great contribution to the local market; the type of fleet dedicated depending on the target species. In Bahamas, snappers; Nassau grouper (*Epinephelus striatus*) and jacks constitute an important resource, apart from lobster and queen conch fishing. Fish is mostly consumed locally although significant exports also take place.

Barbados' main fishery is flying fish (Exocoetidae) and its associated predator, the dolphin fish (*Coryphaena hippurus*). These pelagic species can be captured in coastal areas or offshore by using gill nets, handlines and trolling lines. In coastal areas, Barbadian fishers use daily boats or launches between 6 and 12 metres in length propelled by 10-180 hp inboard diesel engines and in some cases 60-150 hp outboard motors. In offshore areas ice boats of 12 metres or more propelled by engines of over 150hp are used. The use of ice boats has increased over the years with a parallel decline in the use of day boats. Ice boats can spend 7 or 14 days at sea. The fishing areas exploited by the vessels engaged in harvesting flyingfish vary with the time of year. Most of the activity is generally concentrated to the west and south-west of the island and is consistent with the movement of the flying fish as part of its migration process as the fishing season progresses from November to July. Reef fish is captured by moose, small launches of less than 6 metres propelled by 5-40hp outboard motors and oars. Traps, pots and hand lines are used for catching hinds (Serranidae); parrot fishes (Scaridae); grunts (Haemulidae); surgeon fishes (Acanthuridae); tigerfishes (Balistidae) and snappers (Lutjanidae). Offshore also is the place where large pelagic fish are caught; longline fleets main target species are tunas (Scombridae); wahoo (*Acanthocybium solandri*); billfishes (Istiophoridae) and swordfish (*Xiphias gladius*).

Large dug-out canoes equipped with small engines and oars are the crafts used in Belize for finfishing. This activity takes place in southern regions using handlines or nets. Groupers of the genus *Epinephelus* and *Mycteroperca*; snappers of the genus *Lutjanus* and *Ocyurus*;

hogfish (*Lachnolaimus maximus*); king mackerel (*Scomberomorus cavalla*); great barracuda (*Syhyraena barracuda*); and jacks of the genus *Alectis*, *Caranx* and *Trachinotus* are mainly exported. The species harvested for local consumption include grunts (*Haemulidae*), snooks (*Centropomidae*), mullets (*Mugilidae*) and porgies (*Sparidae*).

The Grenadian artisanal fishing fleet consists of pirogues, open vessels and day boats between 3 to 9 meters in length, made in the most cases of wood, and driven by outboard motors or oars. Also 13.17% of vessels are longliners, up to 17 meters in length. Pirogues and open vessels are used for costal pelagic fishing of carangids and small tunas, using traps for the former and lines for the latter; and for demersal fishing of groupers, hinds, snappers and shallow coral reef finfish. Ocean pelagic fishing has been the fastest growing fishery for the last years and accounts for the greater percentage of total annual fish catch. Species caught are yellowfin tuna (*Thunnus albacares*), bill fish (*Istiophoridae*), dolphinfish (*Coryphaena hippurus*) etc. Yellowfin tuna is mainly targeted for export. This fishing is done by multi-day vessels and open day-boats using surface longline on the west coast of the Island. Other species such as wahoo (*Acanthocybium solandri*), small tunas (*Scombridae*), dolphin fish (*Coryphaena hippurus*), king mackerel (*Scomberomorus cavalla*), etc. are targeted by day-boats using troll lines primarily along the east coast.

Guyana's artisanal fishery consists of vessels ranging in size from 6 - 18 m propelled by sails, outboard or inboard engines and using principally gillnets. Seines and lines are also utilized. Inland fisheries comprise subsistence fishing for food and ornamental fish, using small flat bottomed long type vessels and cast nets, seines or handlines. Main species targeted are catfishes (*Ariidae*); drums / croakers (*Scianidae*); jacks (*Carangidae*) and snappers (*Lutjanidae*).

The Jamaican finfish artisanal fishery operates with open canoe or reinforced fibreglass plastic, ranging from 4 - 9 m and powered by outboard motors (25 - 75 hp) or oars. The fishing is divided into inshore fishing, occurring in coastal waters and nine proximal banks, and the offshore fishing (operations based on the offshore cays, as well as deep-sea fishing including the Jamaica/Colombia Joint Regime Area). The main species exploited are demersal reef fish, deep-slope fish, coastal and offshore pelagic, using fish traps, nets and lines.

In Saint Kitts and Nevis, the finfish industry is predominantly artisanal. There are three major fisheries, demersal/reef/bank, coastal pelagic and ocean pelagic. Demersal / reef fishing is the largest in terms of vessels (80%), fishers (75%), and gear (fish traps, handline, and spear gun). Coastal pelagic fishery employs 10% of registered fishers, <3% registered vessels, and accounts for over 40% of total annual landings. Ocean pelagic fishing uses trolling gear and fish aggregating devices (FADs) with vessels powered by two outboard motors ranging from 40 - 250 hp.

The finfish artisanal fleet in Saint Vincent and the Grenadines consists of pirogue vessels over 7 - 10 m in length made of fiberglass and powered by one or two outboard motors ranging from 40 - 75 hp, and used for trolling and handline fishing. Double-enders, open wooden boats 3 - 9 m in length propelled by oars or a small 6-48 hp outboard motor, are used in the beach seine fishery. Longliners range from 10.5-15 m in length and are powered by inboard diesel engines 90 - 190 hp.

Trinidad and Tobago's artisanal fleet consists almost entirely of pirogues. Pirogues are primarily small fiberglass open boats of 7 - 9 m in length, propelled by outboard motors commonly 45 - 75 hp. They are used for commercial and sport day fishing employing primarily handlines, also gill nets, palangue (small bottom longlines) and fish pots (traps). Similar vessels known as "bumboats" are used in Tobago.

8.1.3 Living conditions

While analyzing the results of the surveys, three Living Standards which would define the quality of households were established. These are:

1. **Housing Quality Indicators (HQI):** specific indicators identified during the analysis of results to define the quality of housing. The objective is to determine household's degree of accessibility to each of the criteria. These criteria are accessibility to:
 - Running water
 - A toilet
 - Electricity
 - Kitchen
 - Shower or bath
 - Drainage system for sewage removal
 - Telephone
2. **Overcrowding:** Defines the degree of privacy of household members as it reflects the number of household members sharing a room.
3. **Ownership of durable goods.** This standard is intended to assess the degree of ownership of material possessions, if they are desired or not, and what percentage of respondents can economically afford them.

In this section, these Living Standards will be addressed country by country taking into count the information obtained from the surveys.

The typical **Bahamian** dwelling is an undivided private house of around 4 rooms, owned by its occupants, or in the process of being paid for (paying mortgage). According to the survey, there is an average of 2.6 inhabitants per house. 21% of dwellings subjected to this survey correspond to provided houses fully or partially free of charges. Rented dwellings accounts for only 8.5 % of total.

External walls are mainly made of cement blocks and in some cases wood, and roofs are primarily made of wooden boards, but the use of roof tiles is also appreciable. The predominant flooring material is cement, but marble or mosaics are also used; common floor tiles and wooden boards have been reported.

In general terms, all Bahamian dwellings have an optimum access to the criteria defined as HQI. Although it is important to note that 2.78% of respondents reported the presence of “running water” just at “Their own Community” level, and the same occurred in 0.93% of households with “toilet” criterion and in 1.85% in “electricity” criterion. These cases were identified as vulnerable households living in North Andros’ region.

The high percentage of “do not know / no answer” responses for some of the criteria during the interview process is also notable (Figure 44).

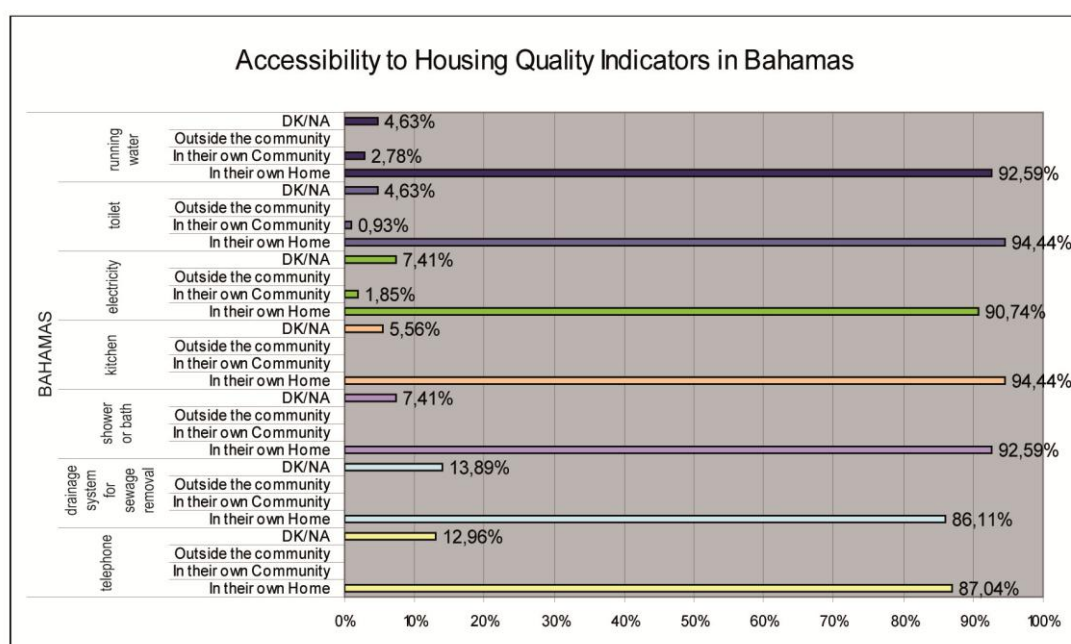


Figure 44: Accessibility to Housing Quality Indicators in The Bahamas

Concerning ownership of durable goods, Bahamian households can afford having practically all the durable goods described for this Study (Table 28). Motor vehicles may be the only material possession that a 3.88% of households studied could not afford. Although around 11% of respondents did not have landline phones, mobile phones and/or washing machines, they do have the financial capacity to afford them.

OWNERSHIP OF DURABLE GOODS						
Do you have?			Would you like to have one?		Can you afford it?	
Country	Durable good	Answer	% based on total population interviewed	% based on those who dont have the product	% based on those who dont have the product	% based on total population interviewed
BAHAMAS	Landline phone	1.Yes	88,35%	77,78%	100%	100%
		2.No	11,65%	22,22%	-	-
	Mobile phone	1.Yes	88,57%	44,44%	83,33%	99,05%
		2.No	11,43%	55,56%	16,67%	0,95%
	TV	1.Yes	97,09%	100,00%	100,00%	100%
		2.No	2,91%	-	-	-
	Washing machine	1.Yes	89,22%	75,00%	100,00%	100%
		2.No	10,78%	25,00%	-	-
	Fridge	1.Yes	97,12%	50,00%	100,00%	100%
		2.No	2,88%	50,00%	-	-
	Motor vehicle	1.Yes	84,47%	84,62%	55,56%	96,12%
		2.No	15,53%	15,38%	44,44%	3,88%

Table 28. Ownership of durable goods in The Bahamas

Barbadian houses are undivided private houses of around 5 rooms. According to the survey there is an average of 2.3 inhabitants per house. Just 65% of respondents are owners of the house. In Barbados there is a 21% of provided houses and 14% of rented ones. There is 7.5% of flats or condominiums, and 4.3% of tenements or compounds.

The use of wood or cement blocks in walls construction is balanced. Roofs are mainly made of zinc sheeting and in less proportion of wooden boards or cement; and floors are made of cement and in cases of wooden boards or bricks.

In general terms, Barbadian dwellings also have an optimum access to the criteria defined as HQI (See Figure 45). Although in “toilet” and “telephone” criteria, at “in their own Community level” were observed percentages of 3.13% and 2.11% respectively. Percentage of responses “Do not know / no answer” are remarkable above all at “drainage system for sewage removal” and “telephone” criteria.

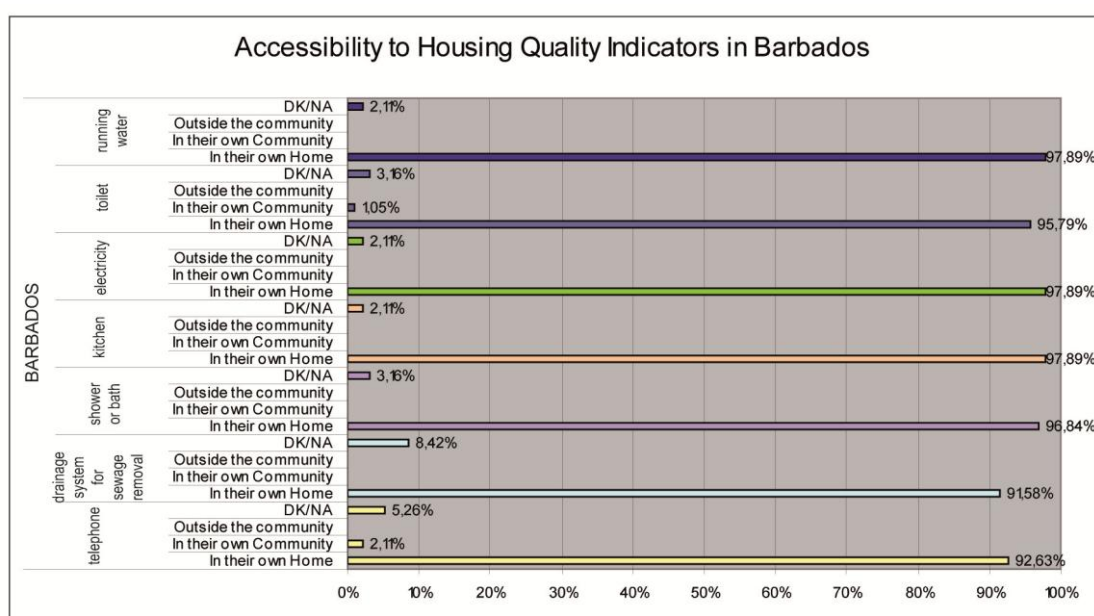


Figure 45. Accessibility to housing Quality Indicators in Barbados

Concerning ownership of durable goods, Barbadian households can afford having practically all the durable goods described for this Study. Motor vehicles and washing machines may be the only material possessions that respectively 36.67% and 9.89% of households studied could not afford (Table 29).

Only 38.89% of Barbadian households have at least one motor vehicle, but it is remarkable that 57.45% of those who do not have it, would not desire to own one. What cannot be assured is if they do not want to have it because they cannot afford it, or simply because they do not need it. A washing machine is a desirable good, but a 9.89% of households cannot afford it. The same is true, albeit on a smaller scale, with mobile phones, refrigerators and television sets.

OWNERSHIP OF DURABLE GOODS						
Do you have?			Would you like to have one?		Can you afford it?	
Country	Durable good	Answer	% based on total population interviewed	% based on those who dont have the product	% based on those who dont have the product	% based on total population interviewed
BARBADOS	Landline phone	1.Yes	83,87%	14,29%	82%	97,85%
		2.No	16,13%	85,71%	18%	2,15%
	Mobile phone	1.Yes	90,32%	71,43%	66,67%	97,85%
		2.No	9,68%	28,57%	33,33%	2,15%
	TV	1.Yes	97,87%	50,00%	50,00%	98,94%
		2.No	2,13%	50,00%	50,00%	1,06%
	Washing machine	1.Yes	84,62%	71,43%	25,00%	90,11%
		2.No	15,38%	28,57%	75,00%	9,89%
	Fridge	1.Yes	97,80%	100%	-	97,80%
		2.No	2,20%	-	100%	2,20%
	Motor vehicle	1.Yes	38,89%	42,55%	19,51%	63,33%
		2.No	61,11%	57,45%	80,49%	36,67%

Table 29. Ownership of durable goods in Barbados

The typical **Belizean** dwelling is an undivided private house with three rooms, owned by its occupants, with walls of concrete or wood and roofed with sheet metal. About 5% of homes are made of inferior materials such as earth and palm tree trunk for walls construction; and palm trees, cardboard and packaging wood for roofs. These materials provide little protection from the elements.¹¹ There is 14.5 % of rented house and 10.26% of provided houses. The average number of inhabitants per house is 4.4.

Household accessibility to HQI in Belize is not as optimal as in other countries surveyed (See Figure 46). One of the points that support this conclusion is the fact that 1.68% of respondents have to leave their community to have access to running water. They have been identified as belonging to vulnerable households from Toledo's region. Data also reflect the necessity of some respondents to resort to their own communities to be provided with "running water", "toilet", "electricity", drainage system for sewage removal" and "telephone". These respondents were identified as belonging to poor households.

Results are significantly influenced by the high percentage of responses "DK/NA", especially for the criteria "toilet", "shower/bath", "drainage system for sewage removal" and "telephone", which recorded rates of between 20.14% and 37.82%.

¹¹ Belize country poverty assessment 2010

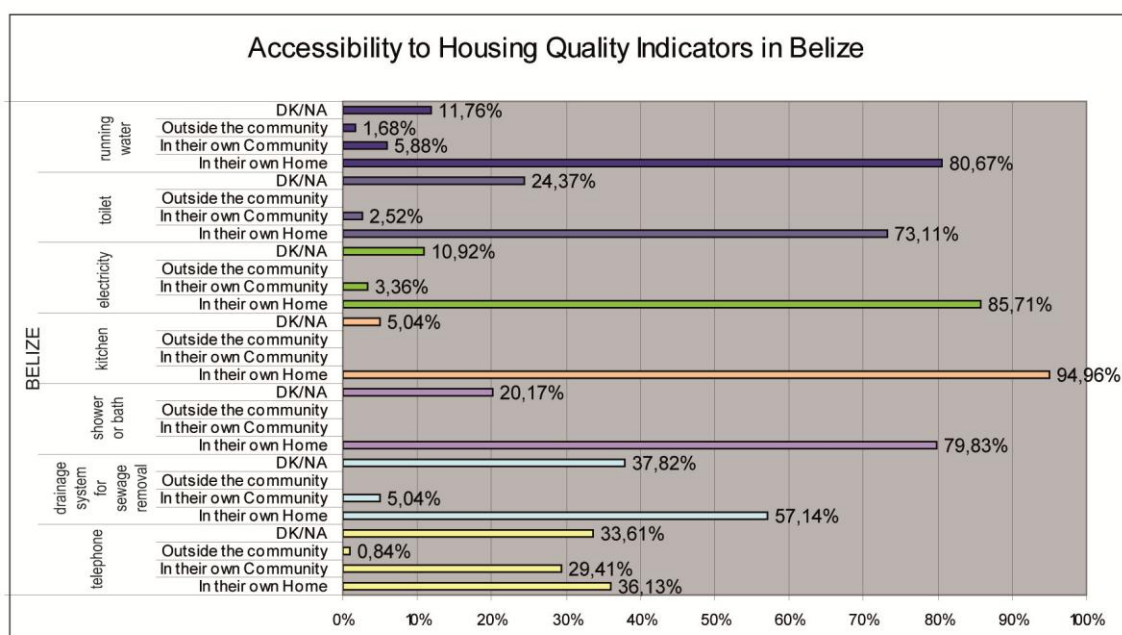


Figure 46. Accessibility to Housing Quality Indicators in Belize

Belizean households have more difficulty in owning durable goods. 60.79% of households do not have a car, 30.43% do not have a washing machine, and 28.07% had no refrigerator, largely because between 18% and 39% of them cannot afford them. 80.53% of households do not have landline phones, but just because almost half of them do not want to have it, probably due to the widespread use of mobile phones (Table 30).

OWNERSHIP OF DURABLE GOODS						
Do you have?			Would you like to have one?		Can you afford it?	
Country	Durable good	Answer	% based on total population interviewed	% based on those who dont have the product	% based on those who dont have the product	% based on total population interviewed
BELIZE	Landline phone	1.Yes	19,47%	54,65%	38%	71,68%
		2.No	80,53%	45,35%	62%	28,32%
	Mobile phone	1.Yes	85,34%	77,78%	28,57%	91,38%
		2.No	14,66%	22,22%	71,43%	8,62%
	TV	1.Yes	86,09%	82,35%	16,67%	91,30%
		2.No	13,91%	17,65%	83,33%	8,70%
	Washing machine	1.Yes	69,57%	82,86%	16,00%	81,74%
		2.No	30,43%	17,14%	84,00%	18,26%
	Fridge	1.Yes	71,93%	87,50%	11,54%	79,82%
		2.No	28,07%	12,50%	88,46%	20,18%
	Motor vehicle	1.Yes	36,21%	66,67%	14,81%	60,34%
		2.No	63,79%	33,33%	85,19%	39,66%

Table 30. Ownership of durable goods in Belize

Grenadian's dwellings are 100% undivided private houses, with 75.45% owned by its inhabitants and a 16.4% provided by the government, and the rest rented. Houses normally are inhabited by an average of 3.6 persons. Use of wood and bricks or cement blocks in wall construction is balanced. Roofs are made of zinc sheeting and floors are made of wooden board, brick or cement.

Apparently Grenadian households also struggle to achieve their own access to the HQI, but this conclusion it is not entirely clear given the high percentage of responses "DK/NA" for every criteria. DK/NA percentages fall between 26.40% and 75.20% (See Figure 47).

Apart from this, 10.4% of respondents declare the necessity of resorting to their own communities to be provided with running water. The same thing occurs on a smaller scale with access to “toilet”, “electricity”, “shower or bath”, “drainage system for sewage removal” and “telephone”. These main problems in access to services have been observed in Saint John’s, Saint Andrew’s and Saint Patrick and they do affect mainly the vulnerable and poor households.

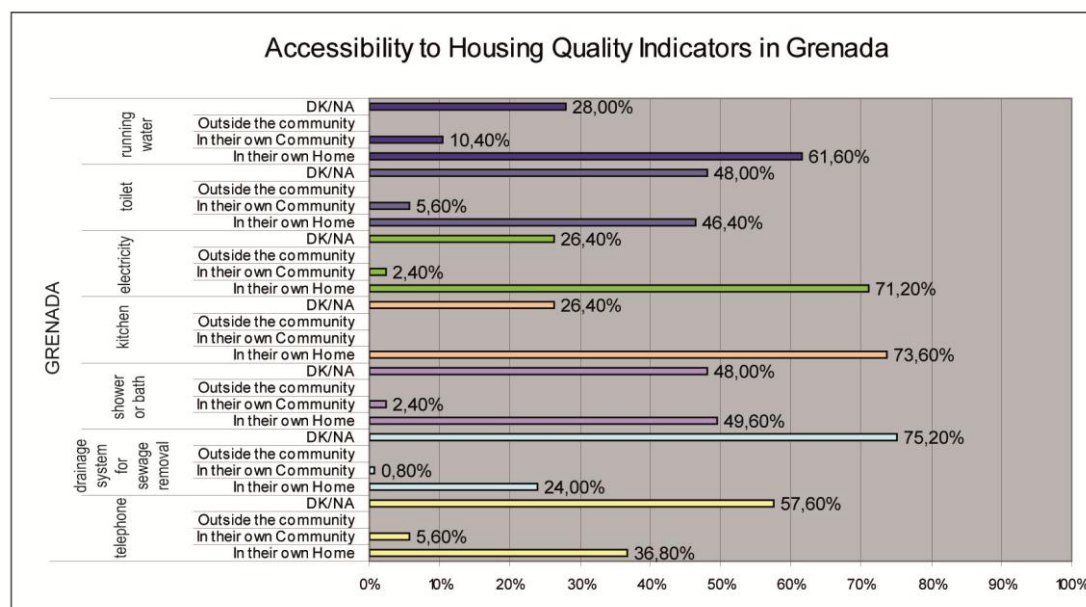


Figure 47. Accessibility to Housing Quality indicators in Grenada

Grenadian households have more difficulty in owning durable goods. 75.65% of households do not have a car, 50.83% do not have a washing machine, and 19.17% have no refrigerator, largely because between 11% and 42% of them cannot afford them. 50.85% of households do not have a landline phone but this is probably due to the widespread use of the mobile phone (Table 31).

OWNERSHIP OF DURABLE GOODS						
Do you have?				Would you like to have one?	Can you afford it?	
Country	Durable good	Answer	% based on total population interviewed	% based on those who dont have the product	% based on those who dont have the product	% based on total population interviewed
GRENADA	Landline phone	1.Yes	49,15%	63,79%	47,50%	82%
		2.No	50,85%	36,21%	52,50%	17,80%
	Movil phone	1.Yes	85,00%	80,00%	60,00%	95,00%
		2.No	15,00%	20,00%	40,00%	5,00%
	TV	1.Yes	85,95%	93,75%	47,06%	93%
		2.No	14,05%	6,25%	52,94%	7,44%
	Washing machine	1.Yes	49,17%	74,58%	31,11%	74%
		2.No	50,83%	25,42%	68,89%	25,83%
	Fridge	1.Yes	80,83%	90,91%	26,32%	88%
		2.No	19,17%	9,09%	73,68%	11,67%
	Motor vehicle	1.Yes	24,35%	73,81%	26,87%	57,39%
		2.No	75,65%	26,19%	73,13%	42,61%

Table 31. Ownership of durable goods in Grenada

Guyana’s dwellings are mainly undivided private houses. In 73% of cases the interviewees were the owners of the house. The percentage of provided houses also is significant (17%), and the remaining dwellings are rented.

More than half of the homes have walls made of wood; a third are made of cement or brick, but it is important to highlight that 1.25% are made of earth or palm tree trunk. Roofs are made of metal sheet, but also 1.25% made of wooden boards or reinforced concrete. Floor materials are mainly wooden boards. Guyana's houses have an average of 4.4 inhabitants, which along with Belize is the country with the highest number of inhabitants per dwelling.

The rate of Guyana household's accessibility to HQI is influenced by the high proportion of answers DK/NA to criteria such as "toilet", "shower or bath", "drainage system for sewage removal" and "telephone". Apart from this, 0.6% of interviewees must resort to their community to make use of "toilet", "shower or bath" or "drainage system for sewage removal" (Figure 48).

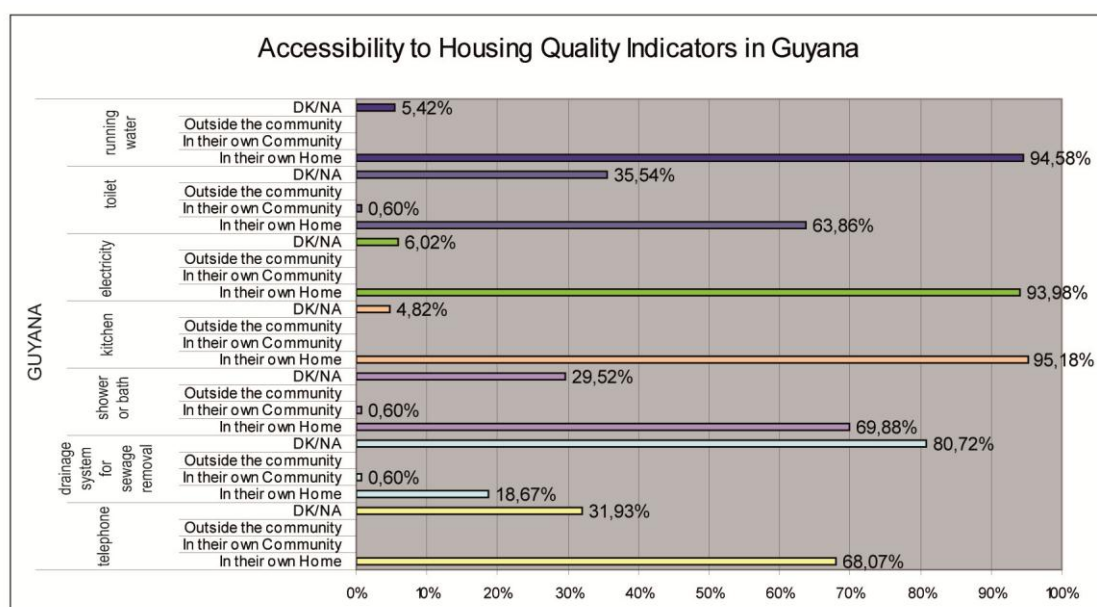


Figure 48. Accessibility to Housing Quality Indicators in Guyana

Concerning the ownership of durable goods, Guyana's households have more difficulty in owning durable goods. Washing machines and motor vehicles may be the material possessions with the smallest presence in the households; both are desirable goods, but 35.22% and 47.8% of homes respectively cannot afford them. The same thing is true on a smaller scale with mobile phones, refrigerators and television sets (Table 32).

OWNERSHIP OF DURABLE GOODS						
Do you have?				Would you like to have one?	Can you afford it?	
Country	Durable good	Answer	% based on total population interviewed	% based on those who dont have the product	% based on those who dont have the product	% based on total population interviewed
GUYANA	Landline phone	1.Yes	67,92%	91,11%	97%	99%
		2.No	32,08%	8,89%	0,03%	0,63%
	Mobile phone	1.Yes	86,88%	55,56%	66,67%	96,88%
		2.No	13,13%	44,44%	33,33%	3,13%
	TV	1.Yes	94,94%	87,50%	42,86%	96%
		2.No	5,06%	12,50%	57,14%	4,43%
	Washing machine	1.Yes	30,82%	60,61%	25,33%	65%
		2.No	69,18%	39,39%	74,67%	35,22%
	Fridge	1.Yes	82,50%	89,29%	18,52%	86%
		2.No	17,50%	10,71%	81,48%	13,75%
	Motor vehicle	1.Yes	32,08%	72,55%	10,59%	52,20%
		2.No	67,92%	27,45%	89,41%	47,80%

Table 32. Ownership of durable goods in Guyana

Houses in **Jamaica** are undivided private houses inhabited by 3.6 persons of whom just 64.8% are their owners; 13.24% of interviewees live under rented conditions; and the rest benefit from provided houses. Flats and tenements are the remaining type of dwellings.

Main wall materials are firstly cement blocks and secondly wood; but inferior materials such as earth, palm tree trunks and waste materials are also used. Zinc sheets are used for building most roofs though cement, roof tiles, wooden boards and reinforced concrete are also used.

Household accessibility to HQI in Jamaica is not as optimal as in other countries surveyed. One of the points that support this conclusion is the fact that 0.42% of respondents' communities do not have "running water" or "drainage system for sewage removal". Data also reflect the necessity of between 6.30% and 16.18% of respondents to resort to their own community to be provided with "running water"; "toilet"; "electricity"; "kitchen"; "shower or bath"; "drainage system for sewage removal" or "telephone". These problems in access to services appear in all regions, principally in vulnerable and poor households but in the case of electricity it can also affect a small percentage of non-poor households. In cases such as "drainage system for sewage removal" and "telephone", accessibility results are significantly influenced by the high percentage of responses "DK/NA". Subsequent clarifications received from Jamaica indicate that the answers DK / NA must be considered as absence of this resource at home (Figure 49).

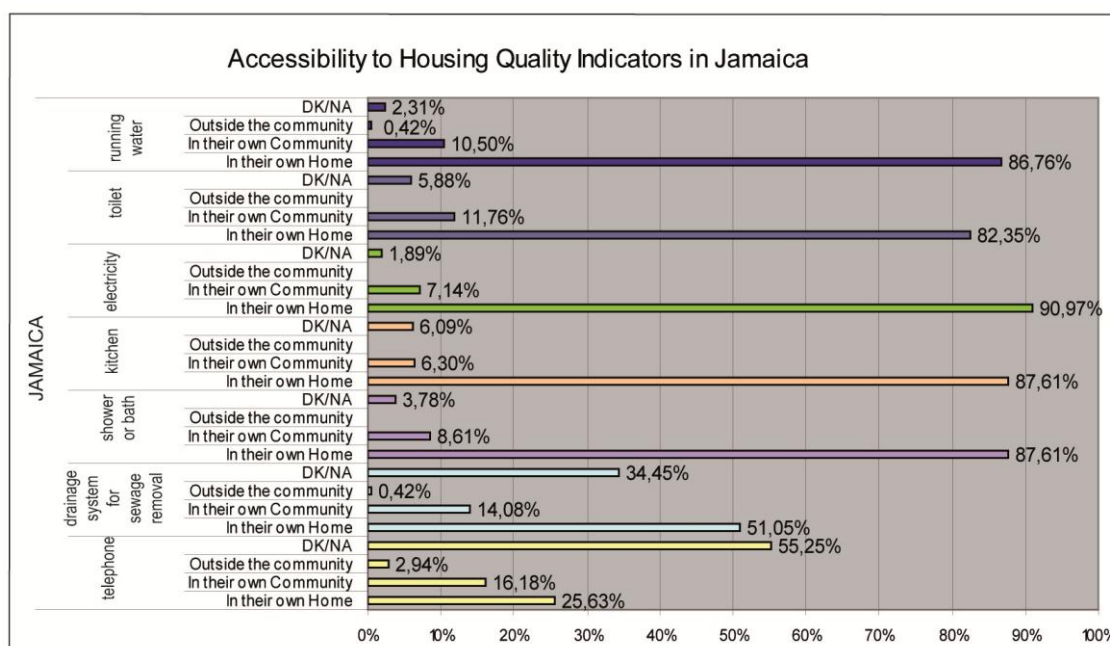


Figure 49. Accessibility to Housing Quality Indicators in Jamaica

Concerning the ownership of durable goods, Jamaican households have more difficulty in owning durable goods. Washing machines and motor vehicles may be the material possessions with the smallest presence in the households; both are desirable goods, but 39.51% and 49.89% of homes respectively cannot afford them. The same thing is true on a smaller scale with refrigerators, televisions and mobile phones. 73.63% of households do not have a landline phone but this is probably due to the widespread use of the mobile phone (Table 33).

OWNERSHIP OF DURABLE GOODS						
Do you have?				Would you like to have one?	Can you afford it?	
Country	Durable good	Answer	% based on total population interviewed	% based on those who dont have the product	% based on those who dont have the product	% based on total population interviewed
JAMAICA	Landline phone	1.Yes	26,37%	42,79%	39%	68,79%
		2.No	73,63%	57,21%	61%	31,21%
	Mobile phone	1.Yes	95,96%	90,00%	89,66%	97,45%
		2.No	4,04%	10,00%	10,34%	2,55%
	TV	1.Yes	92,34%	94,44%	77,52%	93,83%
		2.No	7,66%	5,56%	22,48%	6,17%
	Washing machine	1.Yes	42,60%	87,55%	33,70%	60,49%
		2.No	57,40%	12,45%	66,30%	39,51%
	Fridge	1.Yes	83,33%	100,00%	59,74%	86,75%
		2.No	16,67%	0,00%	40,26%	13,25%
	Motor vehicle	1.Yes	33,70%	91,53%	26,21%	50,11%
		2.No	66,30%	8,47%	73,79%	49,89%

Table 33. Ownership of durable goods in Jamaica

In **Montserrat** dwellings are undivided private houses where 2 people live on average. 75% of respondents are owners of the house they are living in; 22.5% benefit from living in provided houses; and the rest live in rented houses. Flats and apartments are also quite usual in Montserrat.

Walls are made of brick but wood and cement blocks are also widely used. Roofs are made of zinc sheets and cement, wooden boards and roof tiles being used to a lesser extent. Mainly,

cement is used for floor construction though common floor tiles and wooden boards are also used.

In general terms, Montserrat dwellings have optimum access to the criteria defined as HQL. However, between 4.88% and 2.44% of respondents must resort to their community to have access to “running water”; “toilet”; “electricity”; “kitchen”; “shower or bath”; “drainage system for sewage removal”; or “telephone”. All these cases have been identified to happen in vulnerable houses of Carr’s/Little Bay. The percentage of responses “Do not know / no answer” are notable in the telephone criterion (Figure 50).

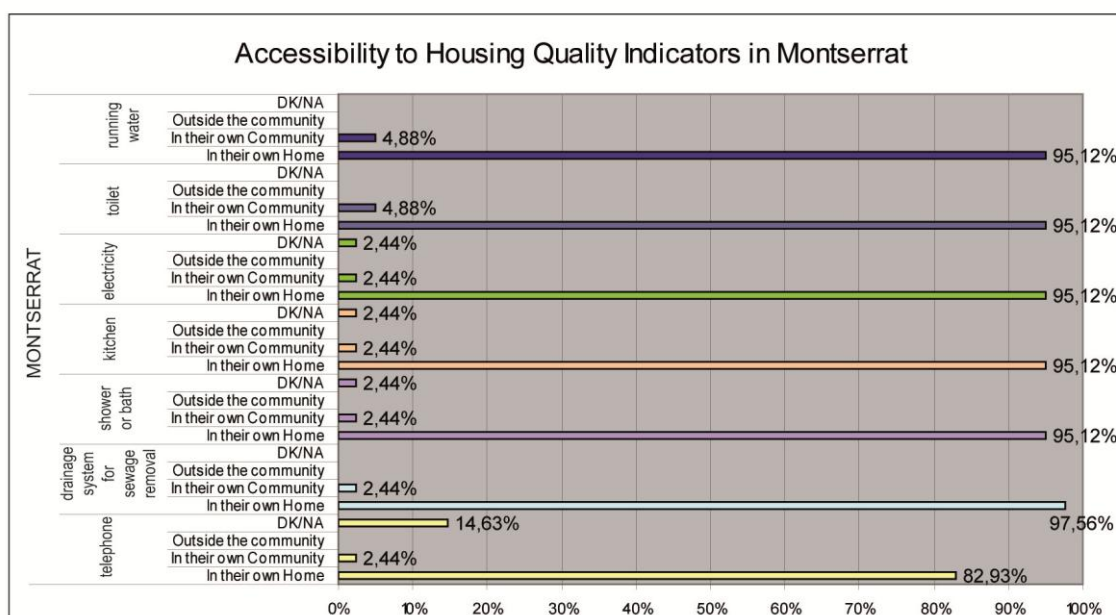


Figure 50. Accessibility to Housing Quality Indicators in Montserrat

Concerning the ownership of durable goods, Montserrat’s households also have more difficulty in owning durable goods. Washing machines and motor vehicles and landline phones may be the material possessions with the smallest presence in the households; the three of them are desirable goods, but 42.50%, 44.74% and 35% of homes respectively cannot afford them.

On a smaller scale the same is true with televisions and refrigerators. It is noteworthy that in this country’s houses the presence of a fridge is more widespread than the presence of a television set (Table 34).

OWNERSHIP OF DURABLE GOODS						
Do you have?			Would you like to have one?		Can you afford it?	
Country	Durable good	Answer	% based on total population interviewed	% based on those who dont have the product	% based on those who dont have the product	% based on total population interviewed
MONTSERRAT	Landline phone	1.Yes	65,00%	90,91%	40%	85,00%
		2.No	35,00%	9,09%	60%	15,00%
	Mobile phone	1.Yes	78,05%	88,89%	-	88,00%
		2.No	21,95%	11,11%	100,00%	12,00%
	TV	1.Yes	82,93%	100,00%	14,29%	85,37%
		2.No	17,07%	0,00%	85,71%	14,63%
	Washing machine	1.Yes	57,50%	100,00%	7,69%	70,00%
		2.No	42,50%	0,00%	92,31%	30,00%
	Fridge	1.Yes	95,12%	66,67%	-	92,68%
		2.No	4,88%	33,33%	100,00%	7,32%
	Motor vehicle	1.Yes	55,26%	70,00%	-	73,68%
		2.No	44,74%	30,00%	100,00%	26,32%

Table 34. Ownership of durable goods in Montserrat

The typical **Saint Kitts and Nevis'** houses are undivided private houses owned by their inhabitants, in which walls are made of cement blocks, roofs of zinc sheets and floors of cement, mosaic, granite or marble. Compounds and flats are also observed in a small proportion. Use of weak materials is observed in roof construction materials such as reinforced concrete, earthenware or clay block. The family unit is comprised of two to three inhabitants.

In general terms, it could be said that Saint Kitts and Nevis households have optimum enough access to the HQI, but the fact that 1.41% of the people do not have access in their community to "toilet", "shower or bath", darkens this conclusion a bit. These cases were identified as non-poor households from Saint Anne's region. The percentage of responses "Do not know / no answer" are notable in the "drainage sewage removal" and "telephone" criteria (Figure 51).

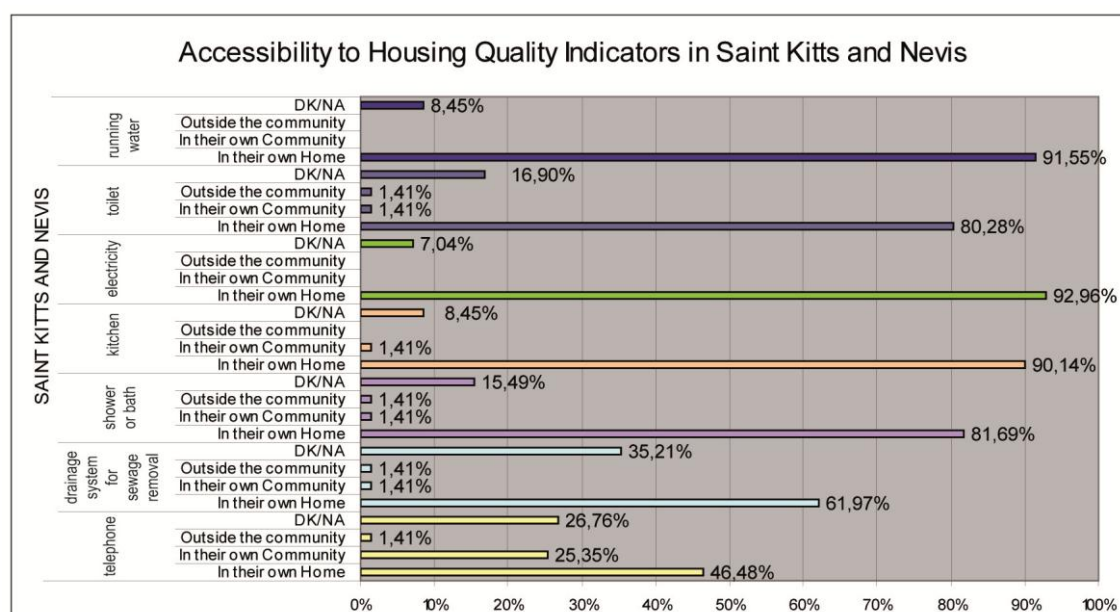


Figure 51. Accessibility to Housing Quality Indicators in Saint Kitts and Nevis

Concerning the ownership of durable goods, Saint Kitts and Nevis' households can afford to have most of the durable goods described for this Study. Motor vehicles and washing

machines may be the only material possessions that 18.84% and 15.94% of households studied respectively could not afford. It is notable that around 30% of those who did not have any of these goods also did not want to have them.

A small percentage of the households studied did not have a fridge or TV, and it is striking that these families considered them as non-desirable goods (Table 35).

OWNERSHIP OF DURABLE GOODS						
Do you have?			Would you like to have one?		Can you afford it?	
Country	Durable good	Answer	% based on total population interviewed	% based on those who dont have the product	% based on those who dont have the product	% based on total population interviewed
SAINT KITTS AND NEVIS	Landline phone	1.Yes	44,12%	8,57%	37,50%	93%
		2.No	55,88%	91,43%	62,50%	7,35%
	Mobile phone	1.Yes	100%	-	-	100%
		2.No	-	-	-	0,00%
	TV	1.Yes	94,29%	-	-	-
		2.No	5,71%	100%	-	-
	Washing machine	1.Yes	75,36%	68,75%	-	84,06%
		2.No	24,64%	31,25%	100%	15,94%
	Fridge	1.Yes	97,14%	-	100%	100%
		2.No	2,86%	100%	-	-
	Motor vehicle	1.Yes	62,32%	65,22%	18,75%	81,16%
		2.No	37,68%	34,78%	81,25%	18,84%

Table 35. Ownership of durable goods in Saint Kitts and Nevis

In **Saint Vincent and the Grenadines** dwellings are undivided private houses whose inhabitants are their proprietors. Provided houses represent 10% of dwelling types and renting a house is not very popular. External walls are made of cement blocks and in a low proportion of wood. Roofs are generally made of zinc sheets and floors of cement. The average number of members in a household is 2.5.

Saint Vincent and the Grenadines is another case of a country in which in general terms households have good accessibility to HQI, but a small percentage of households studied are not provided with “running water”; “toilet”, “electricity” or “shower or bath”; and their inhabitants must resort to their community to make use of them. These cases were identified as vulnerable households from Barrouaille and Great Head Bay (Figure 52).

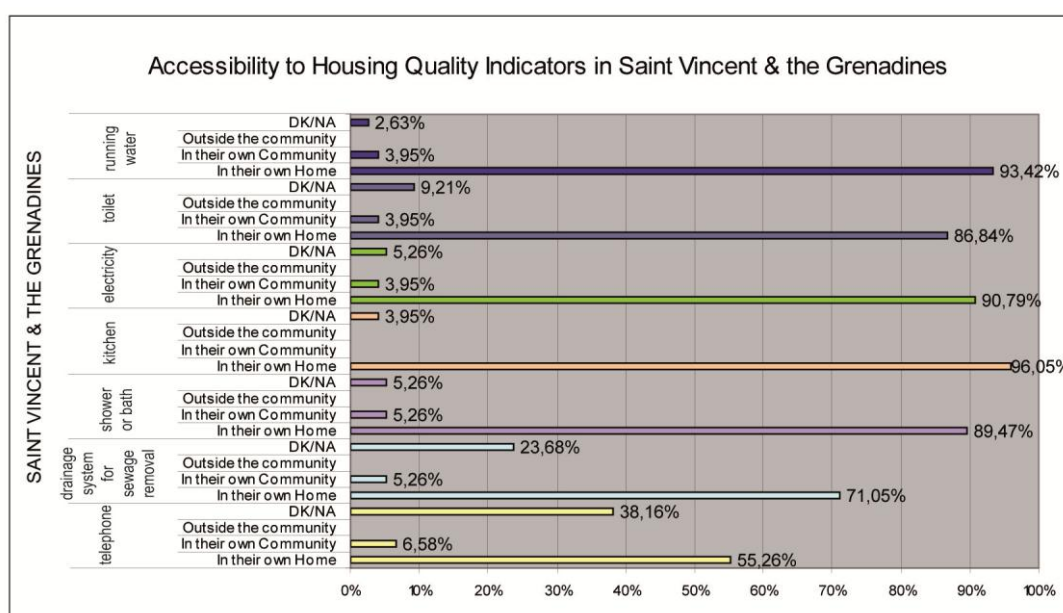


Figure 52. Accessibility to Housing Quality Indicators in Saint Vincent & the Grenadines

Concerning the ownership of durable goods, Saint Vincent and the Grenadines households have more difficulty in owning durable goods. Motor vehicles and washing machines may be the only material possessions that 57.33% and 43.24% of households studied respectively could not afford them. Only 16% of the households have at least one motor vehicle, but it is notable that 47.37% of those who do not have one, would not desire to own one. What cannot be assured is if they do not want to have one because they cannot afford it, or simply because they do not need it. The same is true of the landline phone; 72.22% of those who do not have one also do not want one (Table 36).

OWNERSHIP OF DURABLE GOODS						
Do you have?			Would you like to have one?		Can you afford it?	
Country	Durable good	Answer	% based on total population interviewed	% based on those who dont have the product	% based on those who dont have the product	% based on total population interviewed
SAINT VINCENT AND THE GRENADINES	Landline phone	1.Yes	44,00%	27,78%	35%	73,33%
		2.No	56,00%	72,22%	65%	26,67%
	Mobile phone	1.Yes	80,00%	68,75%	47,06%	88,00%
		2.No	20,00%	31,25%	52,94%	12,00%
	TV	1.Yes	88,00%	77,78%	62,50%	96,00%
		2.No	12,00%	22,22%	37,50%	4,00%
	Washing machine	1.Yes	35,14%	67,39%	21,95%	56,76%
		2.No	64,86%	32,61%	78,05%	43,24%
	Fridge	1.Yes	82,19%	92,31%	15,38%	84,93%
		2.No	17,81%	7,69%	84,62%	15,07%
	Motor vehicle	1.Yes	16,00%	52,63%	14,00%	42,67%
		2.No	84,00%	47,37%	86,00%	57,33%

Table 36 Ownership of durable goods in Saint Vincent and the Grenadines

Trinidad and Tobago's typical house is an undivided private house owned by its inhabitants although in 15% of cases the dwellings are provided houses. Materials used for building dwellings are brick or cement blocks and in a lower proportion wood for the walls; zinc sheets for the roofs and cement or wooden boards for the floors. Households consist of almost 3 persons.

Trinidad and Tobago's houses, in general terms, have good accessibility to HQI, but a small percentage of households studied are not provided with "running water"; "sewage removal" or "telephone"; and its inhabitants have to resort to their community to make use of them. Running water, electricity and shower access problems occur in a small percentage of vulnerable homes in St. Patrick. Sewage problems affect non-poor homes in St. John's and St. David (Figure 53).

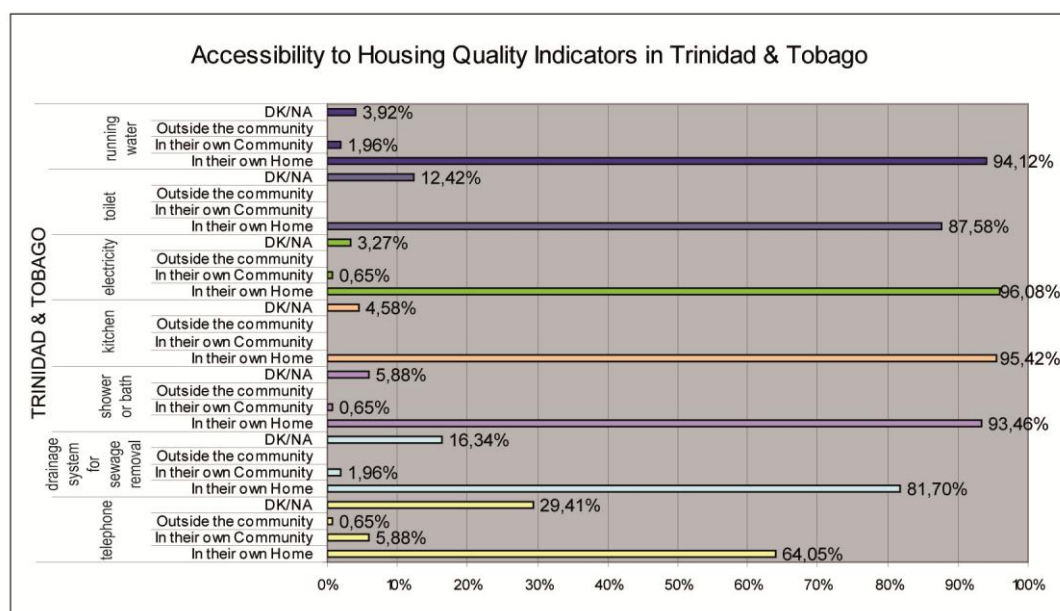


Figure 53. Accessibility to Housing Quality Indicators in Trinidad & Tobago

Concerning the ownership of durable goods, Trinidad and Tobago's households can afford to have practically all the durable goods described for this Study. Motor vehicles and landline phones may be the only material possessions that 34.23% and 14.19% of households studied respectively could not afford.

The fact that a large number of households have no landline phone may be due to the fact that 98.66% of respondents do have a cell phone, and therefore do not consider the landline phone a priority. Washing machines, televisions and refrigerators are desirable goods, but between 2% and 7% of households cannot afford them (Table 37).

OWNERSHIP OF DURABLE GOODS						
Do you have?				Would you like to have one?	Can you afford it?	
Country	Durable good	Answer	% based on total population interviewed	% based on those who dont have the product	% based on those who dont have the product	% based on total population interviewed
TRINIDAD AND TOBAGO	Landline phone	1.Yes	59,46%	47,27%	61,82%	85,81%
		2.No	40,54%	52,73%	38,18%	14,19%
	Mobile phone	1.Yes	98,66%	100%	80,00%	99,33%
		2.No	1,34%	-	20,00%	0,67%
	TV	1.Yes	94,63%	100%	55,56%	97,32%
		2.No	5,37%	-	44,44%	2,68%
	Washing machine	1.Yes	87,92%	80,00%	35,29%	92,62%
		2.No	12,08%	20,00%	64,71%	7,38%
	Fridge	1.Yes	95,95%	100%	55,56%	97,30%
		2.No	4,05%	-	44,44%	2,70%
	Motor vehicle	1.Yes	56,38%	85,25%	19,05%	65,77%
		2.No	43,62%	14,75%	80,95%	34,23%

Table 37. Ownership of durable goods in Trinidad and Tobago

Community Infrastructure

Investment in community-oriented infrastructure should be given a priority. This will enhance the overall quality of life of coastal fishing communities, an issue that has been of major concern so far. Roads to coastal areas, bridges, community halls, schools, fishery-related infrastructure are major investments that can absorb a sizable amount of aid contributions and community labour.

Asphalting and drainage network are what members from fishing communities consider as major needs (Table 38).

	Bahamas	Barbados	Belize	Grenada	Guyana	Jamaica	Montserrat	Saint Kitts and Nevis	Saint Vincent and the Grenadines	Trinidad & Tobago
A. Electricity	0%	0%	4.57%	3.03%	7.19%	5.31%	11.11%	1.05%	2.33%	2.28%
B. Public transport	2.60%	7.69%	10.75%	3.03%	1.96%	6.72%	0%	0%	9.30%	8.68%
C. Health centre	11.69%	7.69%	16.67%	20.20%	3.92%	10.78%	11.11%	5.26%	13.95%	9.13%
D. Asphalting	22.08%	46.15%	17.74%	22.22%	19.61%	26.41%	33.33%	35.79%	31.40%	30.59%
E. Rubbish collection	5.19%	0%	14.25%	2.02%	14.38%	10.31%	0%	4.21%	2.33%	5.94%
F. Drainage network	7.79%	0%	17.74%	13.13%	19.61%	12.81%	33.33%	37.89%	15.12%	20.09%
G. Public school	6.49%	0%	2.69%	4.04%	0.65%	2.34%	0%	2.11%	2.33%	1.37%
H. Gas	6.49%	15.38%	2.42%	3.03%	1.31%	2.03%	0%	2.11%	4.65%	4.11%
I. Running water	2.60%	0%	5.38%	6.06%	5.23%	9.84%	11.11%	1.05%	3.49%	9.13%
J. Water-treatment plant	6.49%	0%	0.54%	5.05%	2.61%	4.53%	0%	1.05%	10.47%	0.91%
K. Garbage dump	7.79%	0%	1.34%	5.05%	3.92%	2.19%	0%	2.11%	3.49%	0.91%
L. Others	20.78%	23.08%	5.91%	13.13%	19.61%	6.72%	0%	7.37%	1.16%	6.85%
TOTAL	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Table 38 Urgent needs of the neighbourhood per countries

8.2 Labour market issues: employment generation in the fisheries sector

The fisheries sector is critical for the Caribbean region since it provides employment for many rural communities, as well as enhancing food security, export earnings and assisting in reducing poverty. In some countries where fisheries are artisanal and small-scale, the sector has been developing from subsistence to commercial operations.

Haughton (2007) reported that approximately 182,000 persons were employed by the fisheries sector (direct and indirect) throughout the region. The majority of those people engaged in fishing often have low levels of formal education, limited access to capital and limited occupational and geographical mobility.

Table 39 shows the contribution of the fisheries sector to direct and indirect employment in the 10 selected Caribbean states. In terms of numbers, Jamaica has the largest number of persons that benefit from the fisheries sector in terms of employment, followed by Guyana, Trinidad and Tobago, Barbados and Saint Vincent and the Grenadines. The fisheries sector in Montserrat and Saint Kitts and Nevis have the lowest levels of employment for countries reported in the Table.

Country	Fisheries sector employment
BAHAMAS	8,800
BARBADOS	6,000
BELIZE	2,369
GRENADA	2,486
GUYANA	17,400
JAMAICA	20,000
MONTSERRAT	76
SAINT KITTS AND NEVIS	600
SAINT VINCENT AND THE GRENADINES	3,000
TRINIDAD AND TOBAGO	9,000
Total Countries studied	69,731

Table 39. Contribution of the Fisheries Sector to Direct and Indirect Employment in 10 selected Caribbean States

According to survey results and as seen in the description of the sample studied, generally in the extractive fishing sector there is no generational replacement. Young people seek jobs in other sectors than agriculture or fishing. In homes of all countries participating in this Study, on average only 1.56 household members, including the respondents themselves, are devoted to the fisheries sector (fishing activity, aquaculture and processing). Household members that contribute financially to the home's livelihood and are not engaged in fishing activities work in agriculture, tourism and service sectors or are involved in other activities (Figure 54).

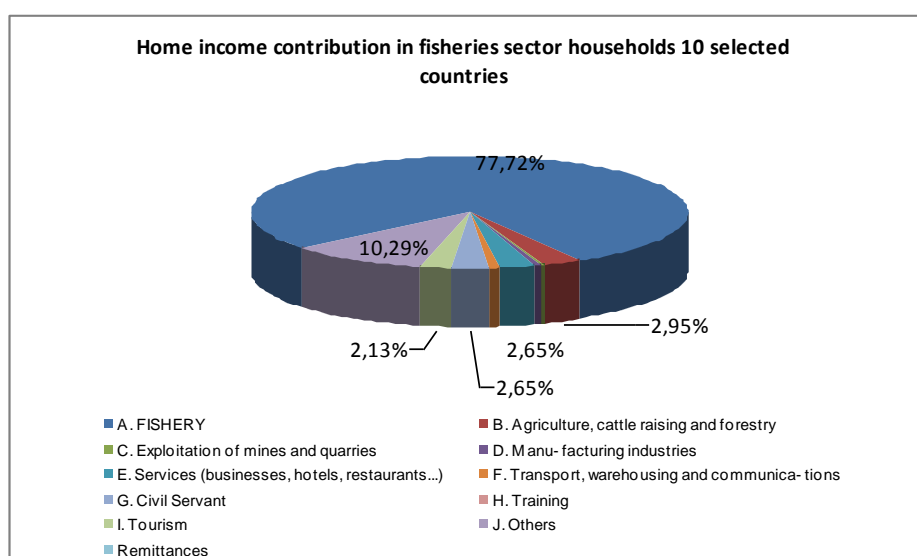


Figure 54. Home income contributions in fisheries sector households - 10 selected countries

Those household members, who contribute to home livelihoods working in activities related to the fishing area, are mainly engaged in the catch process, but also perform marketing activities, construction and repair of fishing gear and processing (Figure 55).

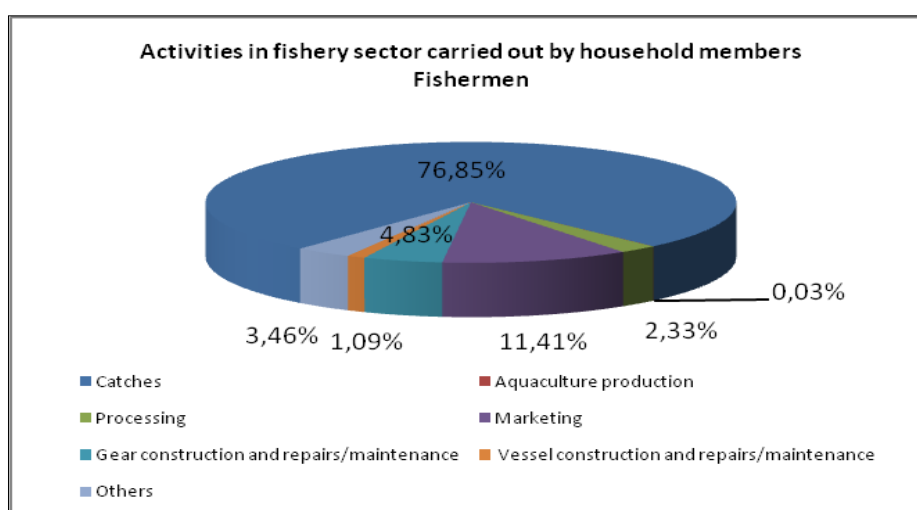


Figure 55. Activities in fisheries sector carried out by Fishermen's household members

Table 40 below shows the relationship of fishing-related activities carried out by family members of the fishermen interviewed, this time disaggregated by country. In the first row of the table is the average number of household members involved in fishing related activities, the respondent is also included.

It can be seen that in all countries the main activity carried out is catching itself, although in Guyana and Montserrat marketing activities and the construction and repair of fishing gear are also important.

Activities	BAHA	BARB	BEL	GREN	GUY	JAM	MONTs	St. K	St. V	T & T	CARICOM
Household members involved in sector activities	1.21	1.08	1.48	1.31	2.72	1.18	2.2	1.179	1,18	1.35	1.49
Catches	86.49%	86.96%	85.47%	86.57%	36.39%	78.70%	47.73%	85.71%	92.96%	81.53%	76.85%
Aquaculture production	-	-	-	-	0.28%	-	-	-	-	-	0.03%
Processing	8.11%	4.35%	0.85%	-	6.67%	-	-	1.30%	1.41%	0.64%	2.33%
Marketing	0.90%	8.70%	10.26%	2.99%	27.22%	13.25%	27.27%	9.09%	4.23%	10.19%	11.41%
Gear construction and repairs/maintenance	0.90%	-	-	3.73%	22.22%	0.26%	19.32%	-	-	1.91%	4.83%
Vessel construction and repairs/maintenance	-	-	0.85%	-	5.00%	0.52%	4.55%	-	-	-	1.09%
Others	-	-	2.56%	-	1.39%	2.08%	-	1.30%	-	4.46%	1.18%

Table 40. Fishing activities carried out by Fishermen's household members

In the aquaculture sector an average of 1.64 household members are involved including the respondents themselves. More than half are engaged in aquaculture production, and the rest are engaged in catch fishing species, marketing or processing (Figure 56).

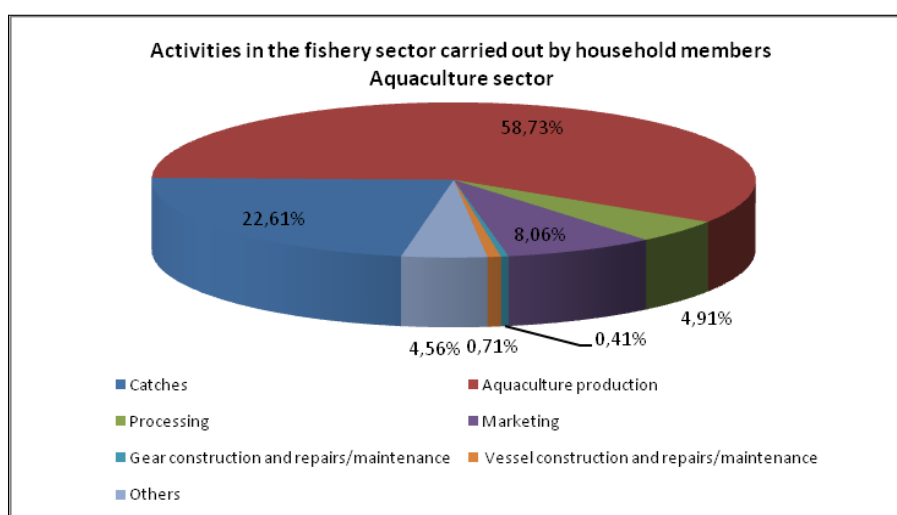


Figure 56. Activities in the fisheries carried out by members of the families of the aquaculture producers interviewed.

The relationship of fishing-related activities carried out by family members of the aquaculture producers interviewed, this time disaggregated by country is given in Table 41 below. In the first row of the Table is the average number of household members involved in fishing related activities, the respondent also being included. The second row shows the number of surveys conducted in the sector in which data have been sufficient to produce this Table. As will be seen, there are countries where it has been impossible to extract information related to this sector due to the lack of response (N/A). In Montserrat no aquaculture activity is taking place so no survey in the aquaculture sector was conducted.

The bulk of all activities are focused on aquaculture production, although the marketing and processing of aquaculture products is also important especially in Guyana and Jamaica. It is noteworthy that according to the results in Trinidad and Tobago 85% of the activities are related to catches.

Activities	Bahamas	Barbados	Belize	Grenada	Guyana	Jamaica	Mont	St. K	St. V	T & T	CARICOM
Household members involved in sector activities	N/A	3	1.44	N/A	1.86	1.17	0	N/A	N/A	2.66	1.69
number of surveys with data	0	1	34	0	15	77	0	0	0	15	14.2
Catches	N/A	-	10.20%	N/A	17.86%	-		N/A	N/A	85%	22.61%
Aquaculture production	N/A	100%	75.51%	N/A	42.86%	67.78%		N/A	N/A	7.50%	58.73%
Processing	N/A	-	4.08%	N/A	7.14%	13.33%		N/A	N/A	-	4.91%
Marketing	N/A	-	4.08%	N/A	14.29%	14.44%		N/A	N/A	7.50%	8.06%
Gear construction and repairs/maintenance	N/A	-	2.04%	N/A	-	-		N/A	N/A	-	0.41%
Vessel construction and repairs/maintenance	N/A	-	-	N/A	3.57%	-		N/A	N/A	-	0.71%
Others	N/A	-	4.08%	N/A	14.29%	4.44%		N/A	N/A	-	4.56%

Table 41. Fishing activities carried out by Aquaculture producers' household members

In the processing sector, an average of 1.5 household members is involved including the respondents themselves. More than half are engaged in processing activities, and the rest are engaged in marketing, capture fishing and other related activities (Figure 57).

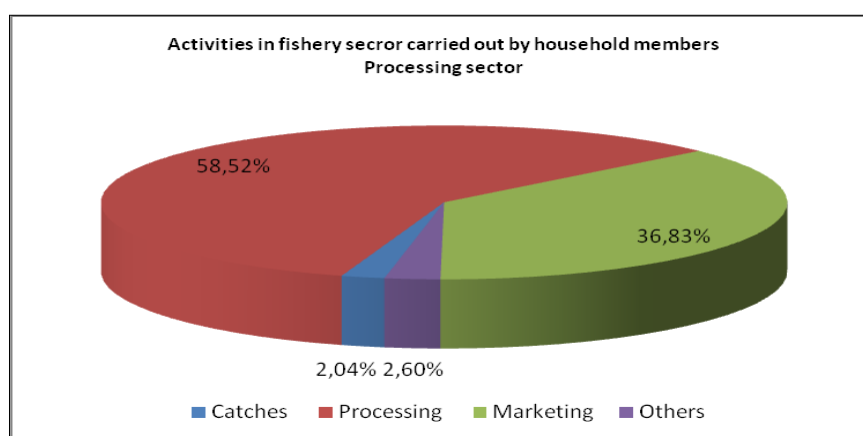


Figure 57. Activities in the fisheries carried out by members of the families of the workers in processing sector interviewed

The Table 42 below shows the relationship of fishing-related activities carried out by family members of workers in the processing sector interviewed, this time disaggregated by country. In the first row of the table is the average number of household members involved in fishing related activities, the respondent also being included. The second row shows the number of surveys conducted in the sector in which data have been sufficient to produce this table. As will be seen, there are countries where it has been impossible to extract information related to this sector due to the lack of response (N/A). In Montserrat no survey was conducted in the aquaculture sector, so the average number of family members participating in the sector is 0.

In most countries the activities related to processing and marketing are balanced. Only in Trinidad and Tobago and Barbados processing exceeds marketing. This means that most large and small companies dedicated to the processing of products related to the fisheries sector also trade them.

Activities	Bahamas	Barbados	Belize	Grenada	Guyana	Jamaica	Montserrat	Saint Kitts and Nevis	Saint Vincent & the Grenadines	Trinidad & Tobago	CARICOM
Household members involved in sector activities	2	2	N/A	2	1.5	1.2	0	1	2	1.78	1.50
number of surveys with data	1	6	0	1	16	5	0	2	1	14	
Catches	-	8.33%	N/A	-	-	-	-	-	-	8%	2.04%
Processing	50%	66.67%	N/A	50%	37.50%	50%		100%	50%	64%	58.52%
Marketing	50%	25%	N/A	50%	41.67%	50%		-	50%	28%	36.83%
Others	-	-	N/A	-	20.83%	-		-	-	-	2.60%

Table 42. Fishing activities carried out by workers in processing sector's household members

8.3 Credits and Savings

The lack of access to affordable credit and the inability to generate savings are major constraints for many poor small fishers and fish workers who, in contrast to larger-scale entrepreneurs, often do not have easy access to credit or savings mechanisms.

There are numerous reasons for the inability of the poor to access savings institutions and credit that should be tackled in programmes to improve access, including:

- few organizational mechanisms to absorb savings;
- cultural and sector-specific issues of willingness and/or ability to save;
- geographic and economic marginalization;
- lack of information;
- lack of bank accounts needed to get credit with banks;
- poor education;
- illiteracy;
- lack of initial assets to use as collateral.

While many small-scale fishers and fish workers live in rural areas, banks are often biased towards urban activities and are not sufficiently decentralized, being mainly located in towns and cities.

The reasons may apply to differing degrees to both informal and formal savings and credit mechanisms. But all these factors combine to make the inability to save and the lack of access to formal credit a tremendous barrier for the poor in generating wealth – no micro-enterprise can start off without access to credit or seed capital.

Informal credit and savings mechanisms have both advantages and disadvantages for the poor, which may be characteristic of developing countries where the formal sector is absent or where the poor are usually excluded from it, rather than specific to small scale fisheries per se. The widespread use of informal credit markets and savings, however, may be as much a function of the lack of alternative options for the poor as of people choosing such sources per se. In the absence of schemes run on a collective basis, informal credit mechanisms, for example, tend to lack transparency and accountability, and money-lenders typically charge high interest rates¹².

In the countries selected for this Study there is a high percentage of households with relatively easy access to loans. Nevertheless, only an average of 27% of households has ever received loans and only in 7% of the cases the money received was considered enough.

Tables 43 and 44 show the percentages of fishing communities' households with access to loans, and the ones able to making ends meet. These results are based on fishermen responses in the surveys.

Government of Grenada provides credits, grants and concessionary loans to fishers at reduced interest rates. During the Validation Workshop it was stated that a third of this country's fishing industry members have been benefiting from government assistance / aid.

Country	%
BAHAMAS	38.89%
BARBADOS	24.66%
BELIZE	48.48%
GRENADA	34.58%
GUYANA	38.82%
JAMAICA	31.31%
MONTSERRAT	20.51%
SAINT KITTS AND NEVIS	57.81%
SAINT VINCENT AND THE GRENADINES	43.48%
TRINIDAD AND TOBAGO	52.98%

Table 43. Percentage of fishing communities' households with access to loans by country

Country	% of households
BAHAMAS	38.04%
BARBADOS	55.91%
BELIZE	21%
GRENADA	17.80%
GUYANA	61.35%
JAMAICA	21.56%
MONTSERRAT	0%
SAINT KITTS AND NEVIS	24.64%
SAINT VINCENT AND THE GRENADINES	32.86%
TRINIDAD AND TOBAGO	45.75%

Table 44. Percentage of fishing communities households that manage to save money making ends meet.

¹² FAO 2007. Increasing the contribution of small-scale fisheries to poverty alleviation and food security

8.4 Education and skills

The education system in almost all the countries studied is based on the traditional British model. In general terms, education is free and compulsory for primary education, normally until 14 or 16 years of age.

Figures 58 and 59 bellow illustrates the educational level of fishermen interviewed in this Study. According the results, half of the respondents had received basic or primary education and almost 40% of the remaining ones had received some secondary education. It was also observed that 3.8% of fishermen attended tertiary education courses. Illiteracy and semi-literacy affects 4.3% of the population studied and cannot be confined to a particular age class.

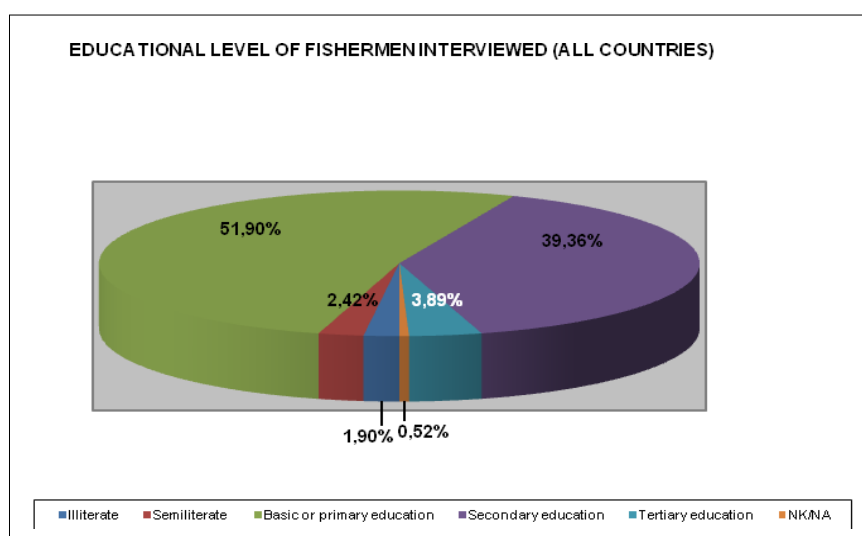


Figure 58. Educational level and age distribution of educational level of fishermen interviewed

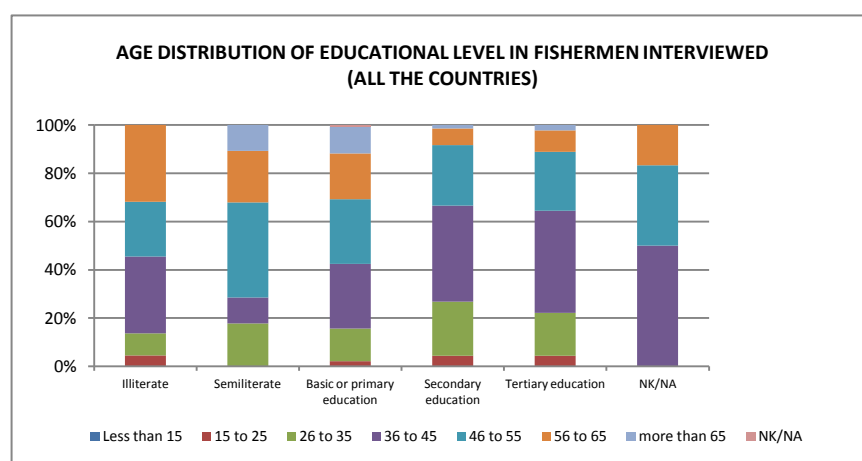


Figure 59. Age distribution of educational level in fishermen interviewed (all the countries)

The educational level's general trend for all household members shows an almost balanced percentage of individuals with primary and secondary education. Illiteracy and semi-illiteracy seems to focus on individuals under 15 years of age.

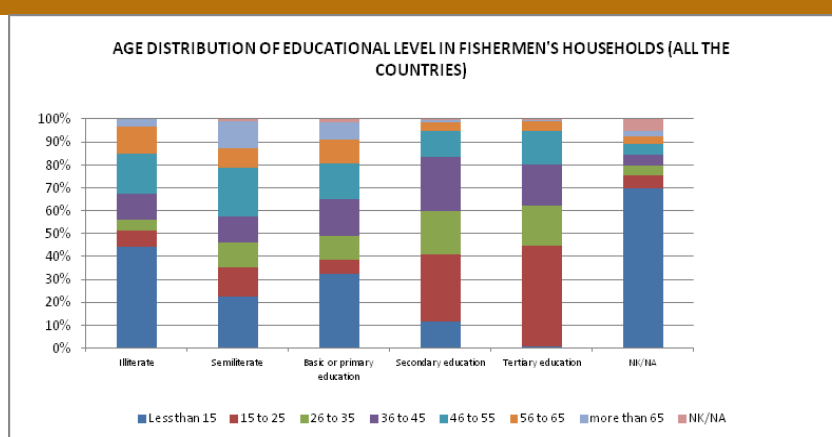


Figure 60. Educational level and age distribution of educational level of fishermen's household members

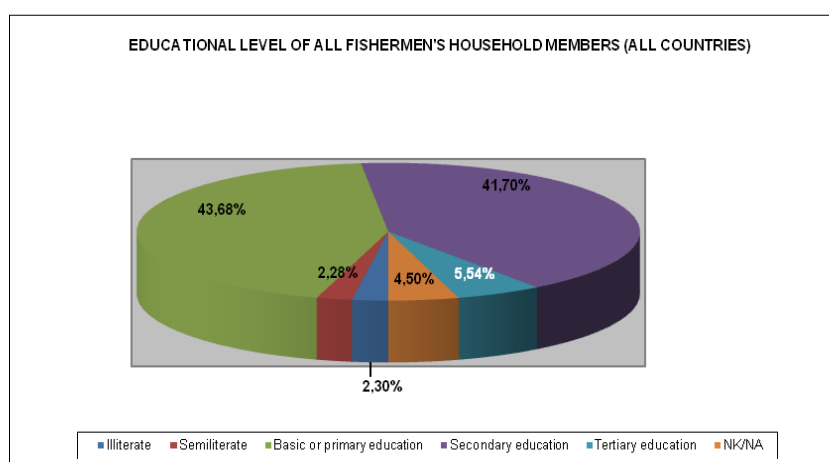


Figure 61. Educational level of all fishermen's household members (all countries)

In analyzing the data from all countries, and from similarities observed between some countries, it was possible to establish four groups with different educational distributions. Country results are incorporated into the appendices.

- Barbados and Montserrat are countries in which both fishermen and household members have all been schooled regardless of the age class they belong to.
- Bahamas, Jamaica, and Saint Kitts and Nevis are countries where secondary education continues to be important but semi-literacy begins to appear reflected in the population above all in those over 65 years of age. The percentage of individuals with primary education increases with each age class, while it decreases in those who have completed secondary education. Tertiary education is concentrated among individuals between 15 and 65, decreasing with age class.
- Saint Vincent and the Grenadines and Trinidad and Tobago are countries where, although the three levels of education occur, primary education is the most widespread. In Saint Vincent and the Grenadines 70% of fishermen household members have only attended primary education. Secondary education is concentrated in ages of between 15 and 45 years.
- Belize, Grenada and Guyana are the countries where semi-literacy seems to be highest.

Vocational training of workers in the fishing industry is essential to improve their knowledge and technology-fishing skills in order to increase productivity within the margins of sustainable fishing.

Governments and NGOs have developed training and educational programmes to encourage responsible fishing practices, promote the sustainability of resources and maintain product quality. As an example, the Government of Trinidad and Tobago continues to support the “Caribbean Fisheries Training and Development Institute” established with the assistance from FAO, which provides a broad range of courses in both maritime and seafood technologies to meet the training requirements of fishers in the Caribbean. In The Bahamas, the public sector conducts educational activities directed at the fishing sector and non-government organizations also provide a variety of printed material that address various fisheries related matters.

Despite all of this, the survey reveals a not particularly high percentage of training among fisher-folk. Given the results, it is noteworthy that as a mean value, only 17.61% of respondents in all countries of the Study had received any kind of training in the last five years.

As can be seen in the Table below, Barbados and Guyana failed to reach the country average of training, being restricted respectively to 5.81% and 9.77% of fishermen interviewed. In Belize, Trinidad and Tobago and Montserrat the percentage of individuals who have received any type of fishery training increases to reach 27.16% of respondents of the country.

Country	Yes	No	DK/NA
BARBADOS	5.81%	94.19%	0%
GUYANA	9.77%	84.21%	6.02%
SAINT VINCENT AND THE GRENADINES	13.89%	84.72%	1.39%
JAMAICA	16.13%	82.99%	0.88%
BAHAMAS	17.31%	82.69%	0%
SAINT KITTS AND NEVIS	18.18%	81.82%	0%
GRENADA	19.35%	76.61%	4.03%
MONTSERRAT	21.95%	78.05%	0%
TRINIDAD AND TOBAGO	26.56%	70.31%	3.13%
BELIZE	27.16%	70.37%	2.47%
Total Countries studied	17.61%	80.60%	1.79%

Table 45. Presence or absence of training related to fishery sector received by the interviewees in the last 5 years

Risk and onboard safety, and fishing techniques are the main type of training provided in all countries, although it should be noted that none of the Barbadian fishermen interviewed had received fishing techniques training, whereas in Saint Kitts none of them had received Risks and onboard training. Food handling, health and hygiene is the third most common type of training course, followed by processing and marketing.

Country	Risks and onboard safety	Food handling, health and hygiene	Aquaculture techniques	Boat skipper	Company administration	Fishing techniques	Processing and marketing	Others
BAHAMAS	27.59%	41.38%	-	3.45%	-	10.34%	10.34%	6.90%
BARBADOS	33.33%	33.33%	-	-	-	-	33.33%	-
BELIZE	14.75%	19.67%	1.64%	9.84%	1.64%	22.95%	16.39%	13.11%
GRENADA	24.53%	13.21%	-	26.42%	1.89%	26.42%	3.77%	3.77%
GUYANA	23.81%	28.57%	4.76%	14.29%	-	19.05%	4.76%	4.76%
JAMAICA	37.80%	7.32%	-	4.88%	-	34.15%	1.22%	14.63%
MONTERRAT	23.08%	7.69%	-	7.69%	-	23.08%	-	38.46%
SAINT KITTS AND NEVIS	-	-	-	7.69%	-	61.54%	7.69%	23.08%
SAINT VINCENT AND THE GRENADINES	40%	-	-	10%	-	50%	-	-
TRINIDAD AND TOBAGO	36.67%	10%	1.67%	6.67%	1.67%	13.33%	10%	20%
Total CARICOM	27.83%	14.78%	0.87%	10.14%	0.87%	25.22%	7.25%	13.04%

Table 46. Type of training received by country

8.5 Health and social benefits

8.5.1 Health

All National Health Policies are committed to empower individuals, communities, and organizations to pursue health and wellness within a health system that guarantees the equitable provision of quality health care. To this end, Health Policies rest on the tenet that health care is a fundamental right of every citizen.

Table 47 below contains information on the presence or absence of any serious illness or disability among the respondents of the three sectors studied. Montserrat, Guyana, Barbados, Jamaica and Trinidad and Tobago are the countries with the highest level of workers with any kind of illness or disability.

To the extent of the Study, the degree of illness or disability is consider as “minor” when the subject can still mostly carry out normal activity and the disability or illness does not pose a considerable financial burden and “severe” when the subject is entirely limited in the activities he/she can perform.

Degree of illness or disability	BAH	BARB	BEL	GREN	GUY	JAM	MONT	ST. KITS	ST. VIN	T & T	TOT Countries studied
	respon ses %	respon ses %	respon ses %	respon ses %	respon ses %	respon ses %	respon ses %	respon ses %	respon ses %	respon ses %	respon ses %
No disability or illness	92.31%	85.11%	93.10%	90%	81.55%	85.90%	70.45%	92.96%	89.74%	87.33%	86.98%
Minor	7.69%	13.83%	6.03%	7.50%	16.67%	9.54%	25%	5.63%	6.41%	8%	10.03%
Medium grade	-	-	-	1.67%	1.19%	3.69%	2.27%	-	3.85%	4%	2.20%
Severe	-	1.06%	0.86%	0.83%	0.60%	0.87%	2.27%	1.41%	0%	0.67%	0.78%

Table 47. Presence or absence of important illness or disability within the respondents of fishing, aquaculture and processing sectors

Montserrat, Jamaica, Barbados, and Guyana are the countries with the highest level of households with members suffering any kind of illness or disability. In general terms illness

and disabilities appear more likely in those aged over 46. However in Belize the age group most susceptible to suffer any disease is composed of children under 15 years of age.

Degree of illness or disability	BAH	BARB	BEL	GREN	GUY	JAM	MONT	ST. K	ST. V	T & T	TOT Countries studied
	responses %	responses %	responses %	responses %	responses %	responses %	responses %	responses %	responses %	responses %	responses %
No disability or illness	92.34%	88.48%	94.81%	94.36%	89.97%	88.38%	79.49%	94.29%	92.61%	90.95%	90.64%
Minor	6.13%	8.76%	3.34%	3.19%	9%	7.34%	16.67%	5.14%	5.11%	5.13%	6.52%
Medium grade	1.53%	1.38%	1.30%	1.47%	0.44%	2.62%	1.28%	-	2.27%	2.93%	1.80%
Severe	-	1.38%	0.56%	0.98%	0.59%	1.66%	2.56%	0.57%	-	0.98%	1.04%

Table 48. Household presence or absence of important illness / disabilities in fishing, aquaculture and processing sector

8.5.2 Social Benefits

8.5.2.1 The social security system

In principle, two main social security agreements exist in the region: the CARICOM social security agreement and the OECS convention on social security. The OECS convention on social security is overall the more comprehensive of the two regional agreements as it covers additional short-term social benefits (such as maternity benefits, sickness benefits, funeral grants etc.), whereas the CARICOM agreement only covers long-term benefits relating to pensions (invalidity, disability, survivors and retirement benefits).

As can be seen in the table 49 more than half the fisher-folk and members of the aquaculture sector interviewed were not participants in a social security system, and only in the processing sector can there be found a significant proportion of interviewees benefiting from it.

Sector and country answers		BAH	BARB	BEL	GREN	GUY	JAM	MONT	ST. K	ST. V	T & T
		responses %	responses %	responses %	responses %	responses %	responses %	responses %	responses %	responses %	responses %
fishing sector	Yes	39	21%	33%	29%	2%	34%	29%	58%	28%	14%
	No	61%	78%	64%	66%	96%	65%	61%	41%	69%	84%
	DK/NA	0%	1%	2%	5%	2%	0%	10%	2%	3%	2%
	Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Processing sector	Yes	86%	43%	100%	67%	87%	100%	-	100%	75%	56%
	No	14%	57%	0%	33%	13%	0%	-	0%	25%	44%
	Total	100%	100%	100%	100%	100%	100%		100%	100%	100%
Aquaculture sector	Yes	-	-	32%	-	24%	11%	-	100%	-	0%
	No	-	-	68%	-	76%	89%	-	0%	-	100%
	Total	-	-	100%	-	100%	100%	-	100%	-	100%

Table 49. Participation in a social security system

8.5.2.2 Subsidies¹³

Several CARICOM Member and Associate Member States provide direct and indirect subsidies to their fisheries sectors. These are administered in the form of incentives aimed at stimulating growth and development of fisheries and aquaculture, primarily by reducing input costs. Measures typically include the provision of subsidized fuel, duty concessions on the purchase of fishing gear and equipment, including fishing boats and engines, and the provision of subsidized loans to fishermen through special credit schemes. The level of incentives and support provided vary from country to country, but is considered negligible overall.

It should be noted from the study the high differences on percentages of fishermen who have received any subsidy from the government in the last five years.

Note: We are considering “subsidy” as “a direct or indirect payment, economic concession, or privilege granted by a government to private firms, households, or other governmental units in order to promote a public objective” (FAO Fisheries Glossary 2001).

"Government" here also includes other governments and public bodies than the ones in the country where the subsidy as such exists. This would, for example, include contributions from public and international development aid and cooperation institutions. It also of course includes actions or inactions by non-fishery government agencies and organizations. If these actions or inactions benefit the fisheries industry in a significant way, they may be fisheries subsidies even if they are not only directed to the sector. Sponsorships by private companies do, however, not constitute subsidies.

Examples of subsidies: low tax on fuel, favourable loans and loans guarantees, non-payment of license fees, landing sites provided free of charge, export incentives and other market interventions, training and extension services, etc.

Country	%
Bahamas	1.92%
Barbados	37.21%
Belize	1.23%
Grenada	42.74%
Guyana	0.75%
Jamaica	4.99%
Montserrat	12.20%
Saint Kitts and Nevis	18.18%
Saint Vincent and the Grenadines	8.33%
Trinidad and Tobago	25%

Table 50. Percentage of fishermen who received a subsidy in the last five years

8.6 Fleet and fleet Productivity

8.6.1 Fleet

The fishing fleet structure of the region is characterized by:

¹³ CRFM. Second Medium Term Plan 2008-2011

- A large artisanal fisheries sector in states where the majority of fishermen operate on day trips utilizing small boats and limited technology. However, some countries define artisanal fisheries differently and it is often used interchangeably with small-scale fisheries. These vessels operate from various points along the coasts and often catches are underreported or unreported.
- An industrial and semi-industrial fleet sector of large, modern, capital intensive vessels ranging in size and technology from those that operate (a) for shrimp off the coast of Guyana and Suriname, (b) for flying fish in the Eastern Caribbean, (c) for tuna and other highly migratory species in the EEZs of the wider Caribbean such as the longliners ranging in lengths of 40 – 80 feet; and (d) the High Seas fishing vessels as listed on the Open Registries of Saint Vincent and the Grenadines and Belize.

The industrial and semi-industrial fleets are supported by modern fishing ports and complexes where catches are landed, inspections are carried out by fisheries authorities and where ice, water, fuel, and provisions for the offshore fishing vessels are acquired. Other fishermen go to fishing community landing sites along the coasts.

8.6.2 Productivity

To assess the productivity of fisheries three (3) types of indicators were used: technical, economic and market indicators.

In the Table 51 below, the **vessels' productivity** is analysed based on the average of quantities landed by each vessel and the sales revenue generated.

In economic terms, Bahamian vessels are the most productive ones, the volume of catch is not high, but their target species reach a high market value, making the revenue generated by the fishing vessel one of the highest in the CARICOM region.

Barbados is the second most productive country in economic terms due to the high catches of its vessels. In high season, ships almost triple the average catch in the Region.

Guyana is the least economically productive country in terms of catch per vessel. The ships are coming to register an average catch over the mean of the region, but the weak point is found in the negligible selling price that the fishery products reach in the market.

Montserrat, Jamaica, Belize and Saint Kitts and Nevis, also have a low economic productivity, in this case it is due to the low fishing capacity of their vessels and in some cases also due to the low selling prices.

Country	Vessel Physical Productivity (VFP)		Vessel Productivity (PV)		Landing prices (LP)	
	Low season	High season	Low season	High season	Low season	High season
	VFP (lbs/vessel)	VFP (lbs/vessel)	PV (US\$/Vessel)	PV (US\$/Vessel)	MP(US\$ Dollar/Lb)	MP(US\$ Dollar/Lb)
Bahamas	138.92	379.34	821.20	2,156.88	5.73	5.56
Barbados	259.74	1,015.19	595.64	2,293.62	2.26	2.26
Belize	53.22	175.24	144.92	511.96	2.69	2.92
Grenada	76.27	343.81	175.68	624.46	2.30	1.82
Guyana	191.16	776.32	92.50	350.81	0.47	0.44
Jamaica	41.38	170.12	91.95	446.92	2.17	2.61
Montserrat	27.22	89.39	96.59	307.59	3.68	3.50
Saint Kitts and Nevis	57.74	155.03	204.35	577.76	3.43	3.61
Saint Vincent & Grenadines	121.32	650.56	190.75	1,502.46	1.46	2.15
Trinidad & Tobago	109.92	532.26	247.92	1,161.06	2.25	2.05
TOTAL AVERAGE	96.65	388.48	233.48	876.97	2.37	2.21
	Technical indicator		Economic indicator			

Table 51. Fleet productivity based on quantities landed and price of first sale

Vessels' productivity can also be measured by the power consumed while fishing and through the hours spent in the process.

Table 52 supports the conclusions of the preceding one. Artisanal fishing crafts of Montserrat, Jamaica and Belize as well as having a low fishing capacity use low power motors contributing to a low profitability of catches; catches are close to the shore and the time expended in fishing is on average around 8 and 27 hours.

Guyana's vessels focus their fishing activities within 60 km of the coast, and in 8 hours' tide reach a considerable volume of catches though not all boats use engines, and if they are used they are low power. So technically speaking, the fishing capacity per unit of power invested in fishing is the highest among all countries studied, however the low sale prices do not turn this technical productivity into a significant economic one.

Country	Power Physical Productivity (PFP)		Power Productivity (PP)		Average power per vessel (HP/vessel)	Per vessel Hour Physical Productivity		Per Vessel Hour Productivity (PVH)	
	Low season	High season	Low season	High season		Low season	High season	Low season	High season
	PFP (lbs/HP)	PFP (lbs/HP)	PP (US\$/HP)	PP (US\$/HP)		HFP (lbs/Hour)	HFP (lbs/hour)	PVH (US\$/hour)	PVH (US\$/hour)
Bahamas	1.06	3.07	6.17	17.19	133	18.16	48.68	106.80	274.54
Barbados	1.52	6.11	3.45	13.80	170	2.29	9.32	5.19	21.06
Belize	1.26	4.22	3.49	12.34	42	1.92	6.25	5.17	18.26
Grenada	1.18	5.32	2.72	9.66	74	8.19	36.99	18.87	67.18
Guyana	7.13	28.48	3.43	12.91	33	24.01	97.04	11.70	43.80
Jamaica	1.05	4.23	2.30	11.17	40	3.10	12.54	7.01	34.08
Montserrat	0.39	1.32	1.45	4.62	66.50	2.50	8.36	9.19	29.26
Saint Kitts and Nevis	0.50	1.33	1.74	4.85	115.33	9.01	24.17	31.71	89.54
Saint Vincent & Grenadines	2.32	12.45	3.54	27.85	51.90	17.42	93.41	26.28	207.02
Trinidad & Tobago	1.25	6.41	2.81	13.17	87.80	6.37	32.74	14.36	67.25
TOTAL AVERAGE	1.38	5.71	3.31	12.69	71.90	5.03	20.63	12.09	46.09
	Technical indicator		Economic indicator			Technical indicator		Economic indicator	

Table 52. Fleet productivity based on units of power and hours dedicated to fishing

Table 53 is intended to assess the productivity of the fleet in each country based on the average number of crew members on vessels. The pattern observed is similar to that in assessing the economic productivity of the fleet. Barbados and the Bahamas, followed by Trinidad and Tobago and Saint Vincent and the Grenadines are the most productive countries in both pounds landed and dollar generated by crew member, while the crews of ships in Guyana, Montserrat, Jamaica and Belize generate lower profits.

Country	Man Physical Productivity		Man Productivity (MP)		Average of crew per vessel	Yield per effort at work (YEW)
	Low season	High season	Low season	High season		YEW (US \$ /Hour)
	MFP(lbs/man)	MFP(lbs/man)	MP(US\$ Dollar/man)	MP(US\$ Dollar/man)		
Bahamas	47.60	133.44	281.64	762.80	2.90	12.78
Barbados	114.92	474.64	263.11	1,072.34	2.31	2.76
Belize	15.57	51.39	42.49	150.12	3.50	3.67
Grenada	27.26	123.63	62.79	224.55	3.03	5.07
Guyana	70.57	289	34.04	128.03	3.08	1.40
Jamaica	14.80	59.84	32.56	158.10	2.98	3.78
Montserrat	11.68	39.06	42.93	136.71	2.50	18.80
Saint Kitts and Nevis	21.06	55.98	74.31	207.99	2.74	9.97
Saint Vincent & Grenadines	30.65	164.38	49.18	387.35	4	4.39
Trinidad & Tobago	42.71	219.54	96.29	450.93	2.61	10.03
TOTAL AVERAGE	33.97	138.50	82.37	310.87	2.98	4.80

Table 53. Fleet productivity by member of the crew

Montserrat appears among the 4 countries with more basic needs met, in which there are only 7.5% of vulnerable households, however the fishing efficiency analysis of the sector shows that Montserrat is one of the two least productive countries; Guyana being the other. In Montserrat vessels are engaged in artisanal fishing experiencing low profitability both in volume of catches as well as in economic earnings. In a country where fishermen declare their total dependence on fishing, fishing capacity of vessels should be important to make the activity sector profitable.

8.7 Impact on the economy

The fisheries sector is a major contributor to income, employment, food security and social and economic stability, especially in coastal communities throughout the Caribbean.

8.7.1 Contribution of small-scale fisheries to household economies

Before analysing the fisheries' impact on the economy of the countries studied, it is important to focus on the importance of fisheries in household livelihood. In the questionnaire, questions were designed to assess the importance that fishing exercised within the family economy and the degree of economic dependence in the home.

Table 54 below shows that Montserrat, Saint Vincent and the Grenadines, Jamaica and Trinidad and Tobago are the countries where fishers' households are more dependent on fishing income. The figure also shows that in Belize, Guyana, Jamaica and Grenada each member of the household working in fisheries has to financially support at least another two

members of his household. Taking into count the responses of interviewees, Belize, Guyana, Saint Vincent and the Grenadines and Montserrat are the countries with the lowest wages in the sector.

Country	Importance of Fishing within Families Index (IFF)	Degree of Economic Dependency Index (DED)	Average wage (AW)
	IFF(%)	DED(No employees/employees)	AW(US Dollar/man per day)
Bahamas	71.76%	1.47	197.03
Barbados	77.58%	1.30	20.01
Belize	71.61%	2.80	4.71
Grenada	87.63%	2.02	20.42
Guyana	78.08%	2.60	4.32
Jamaica	85.98%	2.28	9.30
Montserrat	100%	1.55	5.74
Saint Kitts and Nevis	81.77%	1.63	16.69
Saint Vincent & Grenadines	92.04%	1.99	4.80
Trinidad & Tobago	84.22%	1.62	21.88
TOTAL AVERAGE	75.82%	2.07	15.56

Table 54. Fishing importance on household's economy

In all countries studied the huge majority of fishermen are paid on a “share basis”, that means the total value of the catch landed is shared by each crew member.

8.7.2 Contribution of small scale fishing activity to food security

The direct contribution of fishing activity to food security at the household level is through consumption of the household's catch, i.e. self-consumption (See Table 55). Certainly for many poor households engaged in full-time, seasonal or occasional small-scale fishing activities, such contributions are crucial to individual/household food security.

The percentage of total household catch that is consumed by the household varies greatly, however, and may depend on both the level of commercialization in the fishery and the level of poverty in the household.

The extent to which poverty determines the percentage of the catch that is consumed, is complex and not always clear or well-understood. While it is often assumed that the poor consume a greater proportion of their catch, field research in the Lake Chad area¹⁴ has shown that the poorest households may consume a lower proportion of their catch than better-off households, and instead sell most of their fish in order to be able to purchase cheaper foodstuff.

¹⁴ Béné et al. 2003. *Inland fisheries, poverty and rural livelihoods in the Lake Chad Basin*. *Journal of Asian and African Studies*, 38(1): 17–51

Country	% self-consumption
BAHAMAS	7.8%
BARBADOS	15.9%
BELIZE	10%
GRENADA	16.1%
GUYANA	7.1%
JAMAICA	19.1%
MONTserrat	11%
SAINT KITTS AND NEVIS	14.5%
SAINT VINCENT AND THE GRENADINES	13.5%
TRINIDAD AND TOBAGO	6.7%

Table 55. Percentage of self-consumption of the household's catch by country

8.7.3 Contribution of small-scale fisheries to local economies¹⁵

Fish may be one of the few products in some rural economies that can generate cash to spur and stimulate demand, because other food products may be more generally bartered or consumed within the household.

As well as the direct impacts related to sales, and to income and employment effects on the producers themselves, which result from changes in the demand or production of fish products, there are indirect impacts “upstream” and “downstream” of the production activity that occur through the commodity/supply chain. “Upstream” activities are those activities supplying inputs to the fishing operation. Typical inputs for small-scale capture fisheries include: investment costs in vessels, engines and gear; operational costs of fuel, ice, food, bait; labour costs; financial services; and maintenance costs. “Downstream” activities are those following the harvesting of the product, which themselves require inputs. Some examples of the inputs required are: investment in design, construction and equipping, processing and marketing facilities; labour; transport of fish from landing sites and to markets; financial services; variable costs such as ice, knives, wood for smoking, salt for drying, packaging materials and fish boxes; and maintenance costs.

Country	Inputs	%
BAHAMAS	Fuel	40.38%
	Oil	4.30%
	Ice	1.97%
	Bait	3.06%
	Licences	0.20%
	Insurance	0.49%
	Wages	25.89%
	Boat repair and maintenance costs	2.06%
	Engine repair and maintenance costs ¹⁶	1.49%
	Repair and maintenance costs of fishing gears	2.50%
	Cooperative/association fees	0.01%
	Market taxes	11.33%
	Others:	6.32%
BARBADOS	Fuel	11.80%

¹⁵ FAO. 2005. Strategies for Increasing the Sustainable Contribution of Small-scale Fisheries to Food Security and Poverty Alleviation

Country	Inputs	%
	Oil	2.82%
	Ice	18.24%
	Bait	7.84%
	Licences	0.02%
	Insurance	0.21%
	Wages	50.64%
	Boat repair and maintenance costs	1.48%
	Engine repair and maintenance costsT16	0.89%
	Repair and maintenance costs of fishing gears	0.73%
	Cooperative/association fees	0.02%
	Market taxes	0%
	Others:	5.29%
BELIZE	Fuel	51.83%
	Oil	5.03%
	Ice	9.01%
	Bait	0.93%
	Licences	0.20%
	Insurance	0.06%
	Wages	18.97%
	Boat repair and maintenance costs	2.67%
	Engine repair and maintenance costsT16	1.26%
	Repair and maintenance costs of fishing gears	2.23%
	Cooperative/association fees	4.21%
	Market taxes	1.11%
	Others:	2.50%
GRENADA	Fuel	26.52%
	Oil	3.72%
	Ice	3.06%
	Bait	8.43%
	Licences	0%
	Insurance	0.05%
	Wages	47.55%
	Boat repair and maintenance costs	0.95%
	Engine repair and maintenance costsT16	0.57%
	Repair and maintenance costs of fishing gears	1.03%
	Cooperative/association fees	1.97%
	Market taxes	0.82%
	Others:	5.33%
GUYANA	Fuel	39.14%
	Oil	2.74%
	Ice	19.25%
	Bait	1.85%
	Licences	0.31%
	Insurance	0%
	Wages	11.03%
	Boat repair and maintenance costs	1.16%
	Engine repair and maintenance costsT16	0.60%

Country	Inputs	%
	Repair and maintenance costs of fishing gears	0.85%
	Cooperative/association fees	4.19%
	Market taxes	0.84%
	Others:	18.03%
JAMAICA	Fuel	35.08%
	Oil	1.99%
	Ice	5.17%
	Bait	7.53%
	Licences	0.05%
	Insurance	0%
	Wages	41.33%
	Boat repair and maintenance costs	1.63%
	Engine repair and maintenance costsT16	2.01%
	Repair and maintenance costs of fishing gears	4.05%
	Cooperative/association fees	0.57%
	Market taxes	0%
	Others:	0.58%
MONTSERRAT	Fuel	53.22%
	Oil	7.25%
	Ice	5.90%
	Bait	24.77%
	Licences	0%
	Insurance	0%
	Wages	3.56%
	Boat repair and maintenance costs	1.21%
	Engine repair and maintenance costsT16	0.53%
	Repair and maintenance costs of fishing gears	0.77%
	Cooperative/association fees	0%
	Market taxes	0%
	Others:	2.78%
SAINT KITTS AND NEVIS	Fuel	54.21%
	Oil	8.82%
	Ice	2.03%
	Bait	7.23%
	Licences	0.05%
	Insurance	0.15%
	Wages	22.10%
	Boat repair and maintenance costs	1.95%
	Engine repair and maintenance costsT16	0.63%
	Repair and maintenance costs of fishing gears	1.36%
	Cooperative/association fees	0.08%
	Market taxes	0%
	Others:	1.40%
SAINT VINCENT AND THE GRENADINES	Fuel	63.78%
	Oil	8.26%
	Ice	1.37%
	Bait	3.54%

Country	Inputs	%
	Licences	0%
	Insurance	0%
	Wages	9.11%
	Boat repair and maintenance costs	2.02%
	Engine repair and maintenance costsT16	1.36%
	Repair and maintenance costs of fishing gears	0.98%
	Cooperative/association fees	0.21%
	Market taxes	8.83%
	Others:	0.55%
TRINIDAD AND TOBAGO	Fuel	40.82%
	Oil	7.32%
	Ice	10.76%
	Bait	8.82%
	Licences	0%
	Insurance	0.21%
	Wages	24.47%
	Boat repair and maintenance costs	2.65%
	Engine repair and maintenance costsT16	1.87%
	Repair and maintenance costs of fishing gears	2.68%
	Cooperative/association fees	0.02%
	Market taxes	0.21%
	Others:	0.17%

Table 56. Distribution of cost required (in percentage) per fishing vessels and per country

8.7.4 Contribution of small-scale fisheries to economic growth at the national level Contribution to GDP

The fisheries sector plays an important role in the national economies of the Caribbean countries, where the contribution to the Gross Domestic Product (GDP) accounts for more than one percent in many States in the Region.

Country	% of fisheries sector contribution to GDP
BAHAMAS	1 %
BARBADOS	0.4 %
BELIZE	2.2 %
GRENADA	1.78 %
GUYANA	2.5 %
JAMAICA	0.25 %
MONTSERRAT	0.01 %
SAINT KITTS AND NEVIS	2.39 %
SAINT VINCENT AND THE GRENADINES	0.78 %
TRINIDAD AND TOBAGO	0.07 %

Table 57. Percentage of fisheries sector contribution to GDP
Source: National Fisheries Offices. 2010

Foreign exchange

Small-scale fisheries can make significant contributions to national economies through the generation of foreign exchange derived from international trade. According to the literature, the total quantity of fish imports into the region in 2008 as recorded in the trade statistics was 21,522.6 tonnes whereas exports for the same period were 88,538.7 tones. The quantity of imports represents 24.3% of the total quantity of fish exports in the same period. Jamaica, Barbados and Trinidad and Tobago dominated the fish imports, while Guyana dominated the exports followed by Suriname, Trinidad and Tobago and the Bahamas.

In countries like Bahamas; Belize; Grenada; Jamaica; Saint Vincent and the Grenadines and in less proportion Barbados, exports are dominated by the spiny lobster. The bulk of the specimens landed are exported to USA, Canada, Japan, France or Germany, the rest is sold in the local market. The major local buyers of these products are restaurants, hotels and autochthonous/indigenous population for home consumption. Queen Conch and finfish species such as groupers, snappers, king mackerel (*Scomberomorus cavalla*) and great barracuda (*Sphyraena barracuda*) also command premium prices on the international market. The total consumption of fish and fishery products in several of the smaller states in the region is higher than the local production and has to be satisfied by imports. Imports are also very high in some insular states and account for a large portion of their needs. It is estimated for example that Haiti and Jamaica import more than 60% of their needs which is dominated by dried, salted and smoked fish. Countries such as Barbados, Jamaica and Saint Lucia with relatively large tourist industries also import fresh, chilled and frozen seafood products¹⁶.

Tax generation

Small-scale fisheries can make national-level contributions to economic growth through the generation of a wide range of taxes. This is particularly the case in some countries where (i) fish landings tend to be concentrated at a limited number of sites where it is easy to collect taxes and (ii) where the decentralization process is offering opportunities to local governments to collect revenues. As fish is a very visible product, its trade is easily taxed¹⁷.

However, in most Caribbean countries collection of taxes from small-scale fisheries is not well-established due to the organizational difficulties of tax collection, and the inability or reluctance of small-scale operators to keep sufficient records on which tax levels can be calculated or estimated, or on the level of poverty of fishing communities. This characteristic, which is not specific to the small-scale fisheries, is exacerbated, however, in this specific subsector by (i) the frequent geographical remoteness of the area where fishing communities or camps are established, and (ii) the high degree of informality in capture fisheries and in related small-scale trading and processing activities.

Food security

Fisheries are critical in terms of nutrition and food security in the Caribbean region, as these represent vital sources of animal protein and minerals. Per capita consumption of fish and fish products in the selected countries is between 12 kg and 43 kg per year, which is (except

¹⁶ Caribbean Agribusiness web. <http://174.123.68.234/primary-dropdown/fisheries>

¹⁷ FAO. 2005. Strategies for Increasing the Sustainable Contribution of Small-scale Fisheries to Food Security and Poverty Alleviation

for Belize, Trinidad and Tobago and Saint Vincent and the Grenadines) well above the world average (16.7) (FAOstat 2007). Per capita consumption of fish is approximately 43 kg in Barbados, representing the highest in the region.

Country	Consumption (kg/capita/year)
BAHAMAS	30.28
BARBADOS	43.39
BELIZE	12.51
GRENADA	36.97
GUYANA	33.30
JAMAICA	30.56
MONTSERRAT	---
SAINT KITTS AND NEVIS	31.38
SAINT VINCENT AND THE GRENADINES	16.24
TRINIDAD AND TOBAGO	14.39

Table 58. Shows shares of fish and fish products consumption of selected CARICOM states
Source: Faostat. 2007

Other contribution

Another important contribution to fisheries sector's economy is the recreational fisheries subsector, spanning various aspects of tourism, including domestic and international sports fishing tournaments, yachting, fishing, weekend group and family fishing events. The Caribbean is rated by international magazines as a prime destination for international anglers for billfishes, such as marlins and sailfish, and for several other species of game fishes.

The fisheries sector presents many economic opportunities which can be exploited by CARICOM Member States. Approximately 90% of the fishers are artisanal and most operate exclusively in the coastal waters of their respective states, seldom venturing beyond 50 miles of their 200 miles EEZ. By not fully utilizing their EEZ, parts of it are being utilized by third states to conduct illegal fishing¹⁸.

CAUSES	Bahamas	Barbados	Belize	Grenada	Guyana	Jamaica	Montser rat	St. Kitts & Nevis	St. Vincent & Grenadines	Trinidad & Tobago	TOTAL
Industrial pollution	0%	9.21%	1.62%	5.52%	0.96%	9.94%	1.56%	12.27%	3.16%	17.97%	8.23%
Urban pollution	0%	6.58%	0.81%	4.91%	0.96%	9.94%	0%	2.45%	0%	8.61%	6.26%
Pollution from construction on the sea shore	0.67%	6.58%	2.16%	3.99%	0.48%	8.37%	1.56%	0.61%	8.42%	11.39%	6.17%
Pollution from agriculture / mining	0%	3.95%	1.89%	4.60%	1.92%	5.79%	0%	0.61%	4.21%	3.04%	3.91%
Pollution from aquaculture farms	0%	2.63%	2.97%	3.68%	0%	1.79%	0%	0%	0%	0.51%	1.60%
Overfishing	23.49%	11.84%	14.86%	18.10%	32.21%	10.44%	4.69%	10.43%	24.21%	8.61%	13.81%
Climate change	9.40%	47.37%	14.32%	12.27%	41.83%	11.44%	3.13%	22.70%	31.58%	13.67%	15.81%
Natural disasters	10.07%	1.32%	15.41%	12.58%	1.92%	12.09%	56.25%	3006%	9.47%	4.56%	12.30%
Deterioration/destructio n of habitats (mangrove swamps, reefs...)	15.44%	5.26%	10.27%	8.28%	0.48%	12.16%	10.94%	16.56%	1.05%	8.86%	10.27%
Tourism	0.67%	1.32%	3.51%	1.84%	0%	1.50%	0%	0.61%	4.21%	2.28%	1.73%

¹⁸ Caribbean Agribusiness web. <http://174.123.68.234/primary-dropdown/fisheries>

Recreational fishing	0%	0.00%	1.62%	1.53%	0%	0.72%	0%	0%	0%	1.01%	0.77%
Industrial fishing	1.34%	1.32%	1.08%	3.68%	5.77%	1%	1.56%	1.23%	0%	8.10%	2.47%
Illegal fishing	28.19%	0%	17.84%	10.12%	3.85%	8.73%	6.25%	1.84%	9.47%	8.10%	9.83%
Inexperienced fishermen	6.71%	0%	7.57%	5.83%	2.40%	3.86%	7.81%	0.61%	2.11%	1.27%	3.98%
Others	4.03%	2.63%	4.05%	3.07%	7.21%	2.22%	6.25%	0%	2.11%	2.03%	2.87%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Table 59. Main causes of decreasing catches and sizes (according to fishermen) by country

Aquaculture is another sub-sector where there could be expansion to satisfy the region's growing needs. Globally, in 2008, aquaculture production was reported to be 52.5 million tonnes valued at US\$ 98.4 billion and is projected to grow at an annual rate of 6.6 percent. There is great potential for expansion into ecologically sustainable aquaculture production within the region. This can be achieved both inland using freshwater and in the coastal areas using marine species and sea water (mariculture). The expansion of aquaculture will not only help to meet the high and growing demand for fish protein and employment, but should also reduce the pressure on wild stocks of fish thus giving them an opportunity to recover from over-exploitation and also help in the preservation of other marine life.

8.8 Impact of the environment on fishing communities. Vulnerability to natural hazards

8.8.1 Environmental issues

An essential qualitative evolution in fish landings shows the indirect effects that may be engendered by fisheries on the ecosystem: fishes of small size and decreasing catches. With the only exception being Barbados, most of the interviewed fishermen have observed in recent years a clear reduction in catches (78.3%), as well as a reduction in the size of the species that are caught (55.4%).

Most fishermen consider that this evolution is due mainly to three factors: overfishing, climate change and natural disasters.

Fishing communities in the Caribbean are currently facing environmental- related problems such as:

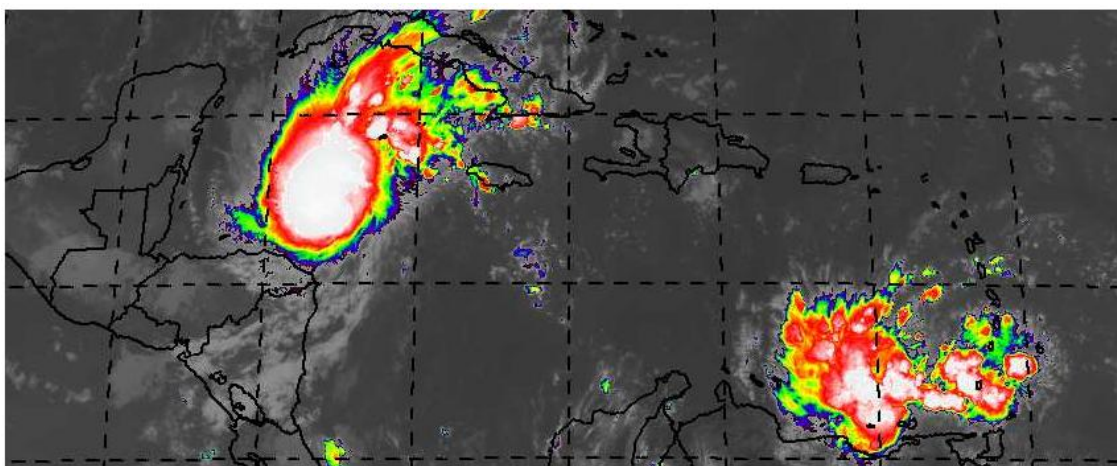
- Poor distribution system for potable water
- Deforestation
- Land erosion
- Coral reef degradation
- Solid and sewage waste disposal that threatens contamination of aquifers
- Coastal waters polluted by industrial waste, sewage, and oil spills

8.8.2 Natural hazards

Each year, Caribbean countries are threatened by significant loss of life, catastrophic property damage and total social disruption as a result of natural disasters. Tropical storms, hurricanes,

tidal waves, heavy rains, droughts, earthquakes and volcanoes have been especially frequent and intense since the early 1970.

Over the past decades, the disasters have cost the region billions of dollars in damage, with an attendant negative impact on economic health and development. Even more devastating is the human suffering and dislocation which prevails long after the disasters have occurred. As is generally the case in developing countries, it is the poor who are most adversely affected when disasters occur.



Following the data of the Study, 37.19% of the surveyed households have been adversely affected by an environmental hazard. The countries most affected in the last five years were Montserrat, Jamaica, Guyana, Saint Vincent and the Grenadines, Belize and Grenada (Figure 62).

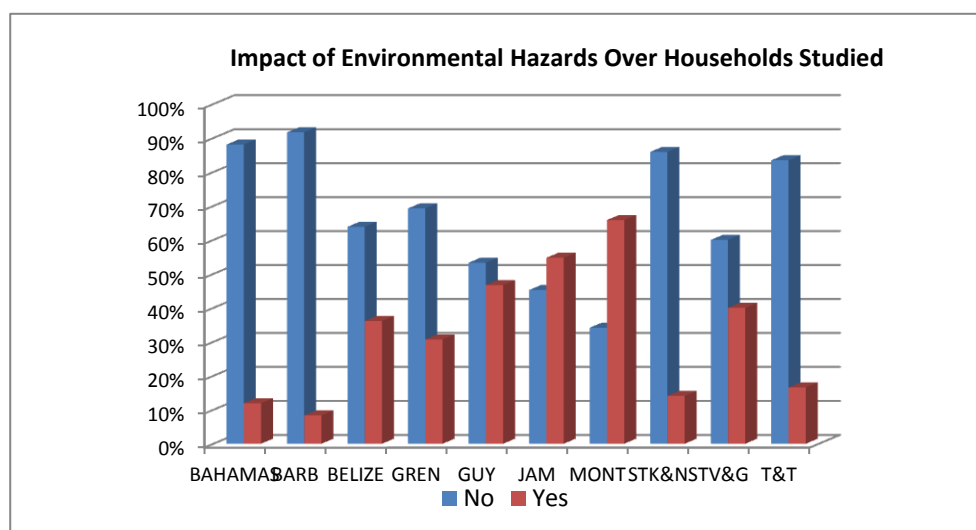


Figure 62. Impact of environmental hazards over studied households

Table 60 below shows the main environmental hazards affecting each country and the proportion of households affected by them.

Hurricanes and floods appear to be the major hazards which households have to face in the Caribbean region.

In Montserrat volcanic activity even removes the spotlight from hurricanes, 63.41% of Montserrat interviewees declared to have suffered the effects of volcanic activity over their homes in the last five years.

Guyana household's main constraints are floods and the climate phenomenon "El Niño".

Country	Earthquakes	Floods	Hurricanes	Fires	Others
BAHAMAS	-	0.92%	10.09%	-	2.75%
BARBADOS	-	1.04%	7.29%	-	-
BELIZE	-	8.40%	26.89%	-	0.84%
GRENADA	0.78%	2.36%	27.55%	0.79%	0.78%
GUYANA	0.60%	40.72%	-	-	5.39%
JAMAICA	0.82%	10.53%	46.28%	3.31%	2.27%
MONTSERRAT	-	4.87%	51.22%	-	60.98%
SAINT KITTS AND NEVIS	-	-	12.68%	1.40%	1.40%
SAINT VINCENT AND THE GRENADINES	-	2.66%	36%	-	1.33%
TRINIDAD AND TOBAGO	1.93%	8.38%	1.94%	1.29%	3.22%
Total general	0.62%	10.46%	25.55%	1.39%	3.94%

Table 60. Type of Hazards suffered

When they were asked how they have managed to sort out the problems in their houses, respondents stated that the main measures taken were: to resort to household savings (39.68%); increase the number of working hours (17.57%); borrow money from family or friends (8.85%); receive assistance from state, church or NGOs (8.85 %).

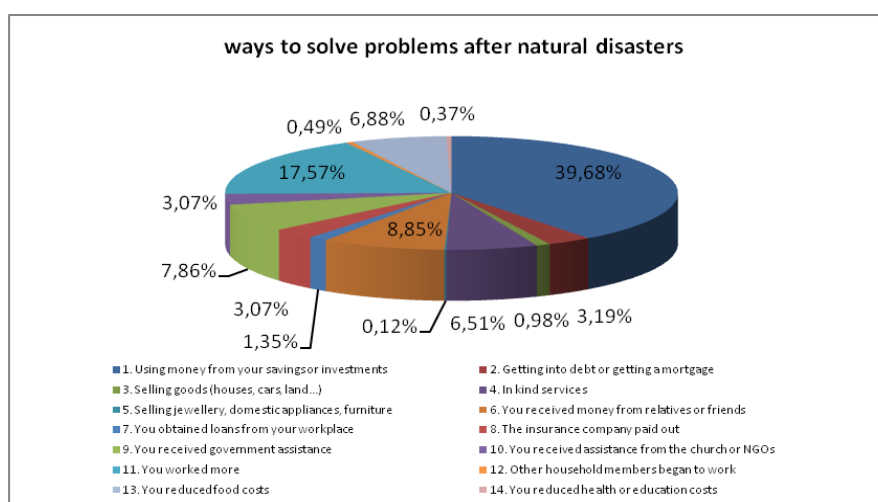


Figure 63. Ways to solve problems after natural disasters

► Climate change

The climate of small island states is influenced by large ocean-atmosphere interactions such as trade winds, El Niño and the monsoons; tropical cyclones and hurricanes are also important components of the climate, as well as sea-level rise. These climate characteristics combined with their particular socioeconomic situations make Small Island Development States (SIDS) some of the most vulnerable countries in the world to climate change. This,

added to the fact that SIDS produce such extremely low levels of greenhouse gas emissions, means that they will suffer disproportionately from the damaging impacts of climate change¹⁹. Climate change is bringing substantial changes to the world's capture fisheries, which are already under stress from overfishing and other anthropogenic influences.

Under climate change, the oceans are warming but this warming is not geographically homogeneous. The combined effect of temperature and salinity changes caused by climate warming is expected to reduce the density of surface waters and thus increase vertical stratification. These changes are likely to reduce nutrient availability in the surface layer and, therefore, primary and secondary production in a warmed world. Moreover, there is evidence that upwelling seasonality may be affected by climate change, with impacts across the food web. The consequences of climate change will probably affect community composition, production and seasonality processes in plankton and fish populations. Increasing acidity (decreasing pH) of the world's oceans is a significant and pervasive longer-term threat to coral reefs. In the short term, increased temperatures linked to coral bleaching may lead to steady degradation of reefs and other ecosystems. In the long term, increasing water acidification and a weakening of the structural integrity of reefs is forecast. The potential for coral reef systems to adapt to these environmental stresses is uncertain.

As temperatures warm, marine fish populations at the pole-ward extents of their ranges will increase in abundance, whereas populations in more equator-ward parts of their range will decline in abundance. In general, climate change is expected to drive the ranges of most terrestrial and marine species towards the poles, expanding the range of warmer-water species and contracting that of colder-water species. The most rapid changes in fish communities will occur with pelagic species that are expected to shift to deeper waters to counteract rising surface temperatures. Moreover, the timing of many animal migrations will be affected. Ocean warming will also alter the predator-prey matches because of the differential responses between plankton components (some responding to temperature change and others to light intensity).

Fisheries-dependent economies, coastal communities and fisherfolk are expected to experience the effects of climate change in a variety of ways. These include: displacement and migration of human populations; effects on coastal communities and infrastructure due to sea-level rise and changes in the frequency, distribution or intensity of tropical storms; and less stable livelihoods and changes in the availability and quantity of fish for food.

The vulnerability of fisheries and fishing communities depends on their exposure and sensitivity to change, but also on the ability of individuals or systems to anticipate and adapt. This adaptive capacity relies on various community assets and can be constrained by culture, current institutional and governance frameworks or marginalized access to adaptive resources. Vulnerability varies between countries and communities and between demographic groups within society. Generally, poorer and less empowered countries and individuals are more vulnerable to the effects of climate change, and the vulnerability of fisheries is likely to be higher where the resources already suffer from overexploitation, the ecosystems are degraded and the communities face poverty and lack sufficient social services and essential infrastructure²⁰.

¹⁹ United Nations. Vulnerability and adaptation to climate change in small island developing states

²⁰ FAO. The State of World Fisheries and Aquaculture 2010

Therefore, and in order to coordinate the Caribbean region's response to climate change, "The Caribbean Community Climate Change Centre" was created. It is the official repository and clearing house for regional climate change data, providing climate change-related policy advice and guidelines to the Caribbean Community (CARICOM) Member States through the CARICOM Secretariat. In this role, the Centre is recognised by the United Nations Framework Convention on Climate Change (UNFCCC), the United Nations Environment Programme (UNEP), and other international agencies as the focal point for climate change issues in the Caribbean. It has also been recognised by the United Nations Institute for Training and Research (UNITAR) as a Centre of Excellence. The centre aims to protect the climate system in the region, enhance capacity of member governments to coordinate national responses to climate change, provide policy and technical support on climate change issues and act as an executing agency for regional projects relating to climate change.

► **Risk assessment and management**

In order to reduce its vulnerability, a country needs to understand the risks to which it is exposed and the potential damage such risks can cause. With this knowledge, a combination of legislation (such as land-use controls and building codes) and other risk reduction measures such as cooperation between government, the insurance industry, donors and civil society will be required to share the burden when disasters strike.

Risk management practices have the potential to greatly help SIDS in preparing for climate change impacts and many activities are already ongoing with regard to disaster risk reduction. The Caribbean Disaster Emergency Management Agency of CARICOM (CDEMA) has focused its attention on Comprehensive Disaster Management (CDM) which is a new thrust in disaster management. The CDM focuses on all cycles of a hazard, involving all sectors of the society, and concentrating on all hazards.

► **The CDEMA operation includes:**

- Training for Disaster Management Personnel;
- Development of model training courses and products including audiovisual aids;
- Institutional Strengthening for Disaster Management Organizations;
- Development of model Disaster Legislation for adaptation and adoption by Participating States;
- Development of model policies and guidelines for use in emergencies;
- Contingency Planning;
- Resource mobilization for strengthening disaster management programmes in Participating States;
- Improving Emergency Telecommunications and Warning Systems;
- Development of Disaster Information and Communication Systems;

- Education and Public Awareness

► **Insurance coverage against natural disaster risk.**

The Caribbean Catastrophe Risk Insurance Facility (CCRIF) is the first multi-country risk pool in the world, and is also the first insurance instrument to successfully develop parametric policies backed by both traditional and capital markets. It is a regional catastrophe fund for Caribbean governments designed to limit the financial impact of devastating hurricanes and earthquakes by quickly providing financial liquidity when a policy is triggered. CCRIF was developed through funding from the Japanese Government, and was capitalised through contributions to a multi-donor Trust Fund by the Government of Canada, the European Union, the World Bank, the governments of the UK and France, the Caribbean Development Bank and the governments of Ireland and Bermuda, as well as through membership fees paid by participating governments. Sixteen governments are currently members of the fund: Anguilla, Antigua and Barbuda, Bahamas, Barbados, Belize, Bermuda, Cayman Islands, Dominica, Grenada, Haiti, Jamaica, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Trinidad and Tobago and Turks and Caicos Islands.

CCRIF offers parametric insurance products that provide coverage for hurricane and earthquakes and will be offering coverage for excess rainfall by November 2011.

8.9 The role of women

Women activities range from shallow water fishing in artisanal fisheries to waged labour in the commercial fishery sector. In such a wide range of activities, women are important contributors to both national and household food security while their labour adds to the foreign earnings of the countries.

Even though women are usually not involved in active fishing (with exception of inland fisheries and lagoon fisheries), they contribute substantially in the pre and post-harvest operations. The diverse array of women's roles in the fishery sector apart from their activities as wives, mothers and homemakers (which engage them from dawn to dusk) includes: fisherwomen; selling fish; acting as auctioneers, agents or merchants; making and repairing nets; drying and salting fish; working as labourers for processing firms; and fish farming.

The fisheries sector in developing countries is recognized as one of the most economically depressed sectors in society. Women (wives or daughters) from fisher households in Southeast Asia, Africa and Latin America are often:

- Overworked, with their contribution unrecognized, unvalued or undervalued;
- Lowly-paid and exploited by employers;
- Illiterate;
- Undernourished and sickly, with poor productivity;
- Lacking opportunities for skills upgrading and access to training.

The findings of this Study on the role of women in the fisheries sector support the entire literature on the subject. Women, except in special cases, are barely actively engaged in fishing, most of them perform their work within the processing industry. In the aquaculture sector, the small percentage of women working, occupy low-skilled jobs.

Table 61 below shows the representation of women in each sector of all participants in this Study.

Country	Women representation in Fishing sector	Women representation in Processing sector	Women representation in Aquaculture sector
Bahamas	1.01%	20%	-
Barbados	3.49%	100%	0%
Belize	8.86%	33.33%	5.71%
Grenada	2.52%	0%	-
Guyana	4.44%	37.50%	17.65%
Jamaica	1.51%	50%	7.41%
Montserrat	6.82%	-	-
Saint Kitts and Nevis	5.97%	50%	0%
Saint Vincent & Grenadines	4.00%	50%	-
Trinidad & Tobago	4.96%	18.75%	6.25%
% of women among the interviewees	3.55%	39.68%	7.80%

Table 61. Percentage of women interviewed in each country within each sector

3.55% of all participants of the ten selected countries were women working in the fishing sector, 39.68% were women working in the processing sector and 7.8% worked in the aquaculture sector.

Belize, Montserrat and Saint Kitts and Nevis are reflected in this Study as the countries with the highest percentage of women working in the fishing sector. Nevertheless, they represent less than 9% of all fisherfolk interviewed.

According to this Study, 100% of workers in Barbados within the processing industry are women working in part-time jobs and performing skilled or middle services workers functions. In Saint Kitts and Nevis and Saint Vincent and the Grenadines women working in processing represent 50% of the workers of the sector interviewed.

A section of the survey was designed to extract information about the percentage of men and women working within each farm or processing point, the type of skills that describe the work they performed, the number of hours of daily work and the salary. Table 62 below represents, for each type of professional skills, the percentage of women that do this work in each country in the processing and the aquaculture sector.

Activity country	BAHA	BARB	BEL	GREN	GUY	JAM	ST. K	ST. V	T & T
% women within each skill									
Non-salaried staff	9.09%	-	-	-	-	11.11%	-	-	-
Professional workers	9.02%	-	30%	60%	28.13%	55.56%	25%	50%	48%
Skilled workers	72.22%	-	68.42%	-	6.91%	41.38%	-	-	25.71%
Middle services workers	53.33%	-	66.67%	85.71%	32.30%	50%	-	100%	65.08%
Semi-skilled workers	47.73%	-	85.71%	-	32.12%	-	100%	66.67%	60.42%
Unskilled workers	8.33%	-	-	25%	60.12%	24.24%	100%	85%	86.96%
Other staff	-	-	-	-	50%	-	-	-	-
% of women working in the area	22.18%	-	65.13%	43.24%	47.30%	35.20%	62.50%	75.76%	53.79%

Table 62. Women Full-employed in processing sector

Saint Vincent and the Grenadines, Belize and Saint Kitts and Nevis are the countries with the highest proportion of women working in the processing industry.

In general terms, the bulk of women working in the industry occupy roles of middle service workers or semi-skilled workers. In Guyana, Saint Vincent and the Grenadines and Trinidad and Tobago unskilled workers are mainly women. Belize and Bahamas are the countries where almost 70% of the skilled jobs are performed by women, and in Jamaica 55.56% of professional workers are women.

Activity Country	BAHA	BARB	BEL	GREN	GUY	JAM	ST. K	ST. V	T & T
% women within each skill									
Non-salaried staff	-	-	18.52%	-	44%	17%	-	-	22%
Professional workers	-	-	-	-	25%	-	0% ²¹	-	33%
Skilled workers	-	-	-	-	40%	-	-	-	22 %
Middle services workers	-	-	-	-	13%	-	-	-	-
Semi-skilled workers	-	-	100%	-	86%	8%	-	-	-
Unskilled workers	-	-	-	-	24%	9.28%	-	-	-
% of women working in the area	-	-	19.30%	-	28%	8.15%	0%	-	23.08%

Table 63. Women Full-employed in Aquaculture sector

Guyana and Trinidad and Tobago have respectively 28% and 23% of women working in the area. In Guyana, the bulk of female staff work in unskilled jobs, but in proportion women are the main people performing semi-skilled jobs. In Trinidad and Tobago, women engage in skilled and professional jobs, but men still hold most of jobs.

No data was obtained for full-time workers in Barbados.

Main problems faced by women

Lack of opportunities for women to hold managerial and decision-making posts are apparent. Gender-disaggregated data, which is needed for in-depth gender analysis is largely lacking in most of Caribbean countries. It is imperative that such data is collected, and gender research is conducted, so that appropriate interventions and policy changes are implemented. This will

²¹ From the result of the surveys was extracted that in Saint Kitts and Nevis only was operating one aquaculture plant, and that 100% of the workers were women. During the validation workshop, the country's representative said that the aquaculture plant is operated by one man.

help to ensure that women are not left out of mainstream development, and are accorded the basic rights to which all humans are entitled.

In addition to the abovementioned problems, women in fisheries in the Caribbean also face:

Poverty

In the fisheries sector, widespread poverty is among the most pressing issues, especially among traditional fishers trying to make a living from the paltry catches of over-exploited waters. Policy changes and better management are called for to change this condition. A range of problems, many with gender dimensions, accompany the poverty of many fishing families and communities²².

There are several indicators that suggest feminisation of poverty in the fisheries sector (in rural areas in general):

- Women are more likely than men to be seen as being economically inactive or to work as unpaid family workers. Even among women in paid employment, a higher proportion of women than men are concentrated in low wage jobs. Extensive studies also show that women producers have poorer access than men to all resources, from land to credit and technology. All these factors suggest that women are likely to comprise the majority of the poor and constitute a compelling case for accepting that the feminisation of poverty is a quantitative reality²³.
- Women are also likely to be impacted by factors and processes that do not affect men. Due to cultural factors, intra-household distribution of food and other resources is far from equal. For the distribution of food, women tend to give priority to their husbands and other adult males as well as to their children. In the context of poverty and food shortages, this results in higher levels of malnutrition, anaemia and related health problems among poor women than among poor men. Although cultural norms require men to fulfil the role of breadwinner, the reality when men are unable to provide sufficient income is that it is the women who are ultimately responsible for ensuring the survival of their children. With or without the income that the husband is expected to provide, women are responsible for feeding, clothing, sheltering and educating their children.

Division of household labour

Household labour studies have shown that women with dual working roles (as wage earner and caregiver) consistently spend two or three hours more than men every day in work-related activities²⁴. Malnourishment and long working hours may have sociological, economic and health implications for women²⁵.

²² Binkley 1995; FAO 1995a; Neis 1996; Williams and Awoyomi 1998.

²³ Whitehead 2003.

²⁴ Levine et al. 2001

²⁵ FAO 1990; FAO 1995b; IFPRI 1995; Tully 1990; Quisumbing et al. 1995

Access to education

Access to general education is often denied children from fishing families, as they make up a large proportion of the labour force in fisheries. Children work as crew on fishing boats, as fish sorters, in fish processing factories, in fish marketing and trading and in households with fisheries-based livelihoods. Boys often have better access to education than girls since they are given preference to attend school.

Other rights

Where laws or customs prevent women from owning land or other productive assets, from getting loans or credit, or from having the right to inheritance or to own their home, they have no assets to leverage for economic stability and cannot invest in their own or their children's futures. Other issues include violence, recognized as a key factor preventing women from exercising their rights²⁶.

8.10 Fisheries co-management

Co-management carries particular appeal for small-scale fisheries because of the conditions under which such fishing takes place. First, the locality and history of small-scale fisheries often means that the pre-conditions for co-management are in place. Small-scale fisheries are usually conducted in near-shore coastal areas that have traditions of user-designed management. The behaviour of participants can be internally monitored, and rules can be enforced.

Second, because of their proximity to shore, small-scale fisheries are often most in need of effective management. They absorb the spillover effects of pollution, habitat destruction and competition for space from larger scale operations. These effects are intensified by general trend of population shifts into coastal regions, and are often highly visible in near-shore areas. Third, the traditional tools and processes on which small-scale fishery management is based are in many cases proving inadequate to contemporary pressures brought by increases in entry, capitalization and exploitation. Small-scale fisheries are often expected to absorb excess labour displaced from other economic sectors. Large-scale offshore fisheries cause near-shore effects including crowding, gear conflicts and localized depletion.

Fourth, small-scale fisheries may have local or regional importance disproportional to their size. In many areas fish are the basis for protein food security of low-income people who depend on the resource base for survival (as explained in point 4.15 of this document). With the expansion of international seafood markets, some small-scale and subsistence food fisheries have been displaced by fisheries directed toward export markets.

For these reasons, finding effective ways to link stakeholders through resource management is critical to management success. The direct involvement of resource stakeholders in the planning and control of resource use offers the potential for improving resource sustainability. The idea behind co-management as a means to link stakeholders is that people vested in planning and decision-making are more likely to pay attention to system level resource effects than those who are not²⁷.

²⁶ AusAID 1997.

²⁷ Hanna, S. 1998. Co-management in small-scale fisheries: creating effective links among stakeholders.

The cooperative type of co-management is where government and users cooperate together as equal partners in decision-making and this type of co-management is seen as the “real” type of co-management.

The Study shows that fishermen from all selected countries (with the exception of Belize and Jamaica) do not feel that they are involved in the decision making processes as they are not consulted (neither as individuals or through associations) by the fisheries administration. Furthermore, they show a low-medium level knowledge concerning the existence of fishery policies, strategies and management plans (with the exception, again, of Belize and Jamaica).

By contrast, an average of almost 80% of the interviewees is familiar with the laws and regulations that govern the fishing sector in their countries.

Table 64 shows the percentage of fishermen interviewed who did not consider that they are consulted by the fishing administration as part of the decision-making processes.

Country	%
BAHAMAS	3.85%
BARBADOS	3.49%
BELIZE	32.10%
GRENADA	2.42%
GUYANA	6.02%
JAMAICA	13.49%
MONTERRAT	7.32%
SAINT KITTS AND NEVIS	3.03%
SAINT VINCENT AND THE GRENADINES	6.94%
TRINIDAD AND TOBAGO	4.69%

Table 64. Percentage of fisherman that consider they are consulted by the fishing administration as part of the decision- making processes

Country	%
BAHAMAS	38.46%
BARBADOS	37.21%
BELIZE	79.01%
GRENADA	31.45%
GUYANA	22.56%
JAMAICA	66.28%
MONTERRAT	29.27%
SAINT KITTS AND NEVIS	16.67%
SAINT VINCENT AND THE GRENADINES	47.22%
TRINIDAD AND TOBAGO	32.03%

Table 65. Percentage of fisherman familiar with policies, strategies and plans

Country	%
BAHAMAS	99.04%
BARBADOS	75.58%
BELIZE	95.06%
GRENADA	89.52%
GUYANA	66.92%
JAMAICA	93.26%
MONTserrat	78.05%
SAINT KITTS AND NEVIS	83.33%
SAINT VINCENT AND THE GRENADINES	68.06%
TRINIDAD AND TOBAGO	49.22%

Table 66. Percentage of fisherman familiar with laws/regulations

8.11 Main concerns of the fishery sector.

Being aware of the needs and concerns of the sector is fundamental in establishing political and social actions to strengthen fisheries and fishery sector livelihoods.

Table 67 shows the main concerns of fishermen in the ten selected countries. Problems regarding infrastructure for unloading is the main extended concern, above all in Montserrat, St. Kitts and Nevis and Trinidad and Tobago. Problems in meeting the supply and maintenance needs are also abundant above all in Montserrat, Jamaica and Grenada.

PROBLEMS		BAH	BARB	BEL	GREN	GUY	JAM	MONT	ST. K	ST. V.	T & T
Regarding fishing grounds/zones	Yes	25.96%	6.98%	28.40%	25.00%	32.33%	42.82%	60.98%	28.79%	20.83%	44.53%
	No	74.04%	90.70%	69.14%	73.39%	66.17%	56.30%	34.15%	66.67%	77.78%	53.13%
	DK/NA	0.00%	2.33%	2.47%	1.61%	1.50%	0.88%	4.88%	4.55%	1.39%	2.34%
Regarding infrastructures for unloading	Yes	14.42%	47.67%	11.11%	41.13%	26.32%	37.24%	82.93%	74.24%	25.00%	74.22%
	No	84.62%	52.33%	86.42%	57.26%	72.93%	62.17%	17.07%	25.76%	73.61%	23.44%
	DK/NA	0.96%	0.00%	2.47%	1.61%	0.75%	0.59%	0.00%	0.00%	1.39%	2.34%
Meeting your supply and maintenance needs	Yes	23.08%	13.95%	30.86%	50.81%	19.55%	66.28%	82.93%	46.97%	44.44%	35.94%
	No	75.96%	82.56%	65.43%	40.32%	78.95%	33.14%	14.63%	48.48%	54.17%	59.38%
	DK/NA	0.96%	3.49%	3.70%	8.87%	1.50%	0.59%	2.44%	4.55%	1.39%	4.69%
Regarding coastguards	Yes	5.77%	22.09%	9.88%	33.06%	4.51%	10.26%	9.76%	6.06%	9.72%	35.16%
	No	93.27%	76.74%	86.42%	63.71%	93.98%	88.86%	87.80%	93.94%	88.89%	62.50%
	DK/NA	0.96%	1.16%	3.70%	3.23%	1.50%	0.88%	2.44%	0.00%	1.39%	2.34%
Regarding industrial fishermen	Yes	11.54%	3.49%	6.17%	32.26%	39.10%	14.08%	9.76%	16.67%	1.39%	40.63%
	No	59.62%	94.19%	65.43%	62.90%	59.40%	85.04%	73.17%	83.33%	97.22%	57.03%
	DK/NA	28.85%	2.33%	28.40%	4.84%	1.50%	0.88%	17.07%	0.00%	1.39%	2.34%
Regarding recreational fishermen	Yes	14.42%	2.33%	8.64%	15.32%	1.50%	8.80%	4.88%	30.30%	1.39%	8.59%
	No	84.62%	96.51%	87.65%	79.84%	73.68%	90.32%	90.24%	69.70%	97.22%	89.06%
	DK/NA	0.96%	1.16%	3.70%	4.84%	24.81%	0.88%	4.88%	0.00%	1.39%	2.34%
Finding a crew	Yes	4.81%	10.91%	12.96%	11.54%	57.25%	10.10%	43.24%	12.00%	4.69%	16.83%
	No	86.54%	87.27%	87.04%	74.04%	33.59%	84.32%	43.24%	88.00%	67.19%	70.30%
	DK/NA	8.65%	1.82%	0.00%	14.42%	9.16%	5.57%	13.51%	0.00%	28.13%	12.87%

Table 67. Main concerns of the fishery sector. Ten selected countries

Regarding issues related to marketing, the main constraints appear to be the lack of adequate markets and the low price of fish. In most countries these two constraints appear to be balanced. However in Barbados and Guyana the low fish prices acquire a greater role. In Montserrat and Trinidad and Tobago, the most important marketing problems are related to the infrastructures - lack of and adequate market and lack of handling and or preservation facilities. For the fishermen of Jamaica, the main concerns related to marketing of their products are their low demand and the lack of adequate markets.

Main marketing problems	BAH	BARB	BEL	GREN	GUY	JAM	MONT	ST. K	ST. V.	T & T
Low price of fish	49.38%	70.93%	42.48%	30.39%	63.78%	9.82%	1.75%	1.69%	38.89%	23.35%
Low demand	14.81%	3.49%	18.58%	18.63%	9.73%	39.57%	10.53%	18.64%	8.33%	11.17%
Lack of handling/preservation facilities	0.00%	8.14%	10.62%	7.84%	1.62%	6.13%	40.35%	15.25%	13.89%	27.41%
Lack of an adequate market	30.86%	17.44%	23.01%	42.16%	22.16%	33.74%	45.61%	57.63%	37.04%	30.46%
Others	4.94%	0.00%	5.31%	0.98%	2.70%	10.74%	1.75%	6.78%	1.85%	7.61%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Table 68. Main marketing problems.

9. Status of the aquaculture subsector

The aquaculture / mariculture sector is not well developed in the CARICOM region, with significant aquaculture development in only two countries, Jamaica and Belize.

Most CARICOM states have limited land and fresh water resources, however some, like Guyana and Belize, do have ample supplies. On the other hand, most states have larger expanses of marine space than land mass, which offers the potential for the promotion and development of mariculture.

Due to the relatively early stages in development of the aquaculture industry in most of the Caribbean countries, at present the respective public sectors in charge of regulating and assisting the promotion of the industry are generally weakly organized. In all of the countries, Aquaculture Units have been established within the Department of Fisheries attached to the Ministries of Agriculture.

Aquaculture has been identified as a sector in the region that has considerable potential for improving social and economic conditions of rural and coastal people, whilst simultaneously contributing to regional and national economic growth, generating employment and earning foreign exchange.

In Barbados there is only one freshwater aquaculture facility (for red tilapia) located in the parish of Saint George.

In Belize there are a total of 35 facilities distributed as follows:

Districts	Facilities
Belize City	10
Stann Creek	3
Toledo	6
Orange Walk	7
Cayo	9

Table 69. Number of aquaculture facilities in Belize

The State of Guyana counts 18 facilities distributed in five regions:

Regions	Facilities
Region 2	1
Region 3	9
Region 4	1
Region 5	3
Region 6	4

Table 70. Number of aquaculture facilities in Guyana

Jamaica presents the most significant aquaculture development with more than 233 facilities: (for this Study a sample of 139 was considered) distributed as follows:

Parish	Facilities	Sample
Clarendon	23	13
Hanover	4	3
Kingston	26	23
Manchester	1	1
Portland	6	1
Saint Andrew	5	5
Saint Ann	4	5
Saint Catherine	128	70
Saint Elizabeth	8	4
Saint James	5	2
Saint Mary	4	3
Saint Thomas	6	4
Trelawny	6	2
Westmoreland	7	3

Table 71. Number of aquaculture facilities in Jamaica

Saint Kitts and Nevis counts only one brackish water aquaculture facility in the community of Conaree in the parish of Saint Peter (Saint Kitts).

In Trinidad and Tobago there are a total number of 16 facilities, most of them allocated in the parishes of Caroni and Victoria.

Parish/ Region	Facilities
Caroni	7
St. Andrew / St. David	2
St. George	1
Victoria	6

Table 72. Number of Aquaculture facilities in Trinidad and Tobago

The industry seems to be fairly recent in the countries studied as the average age of the farms in most cases is less than ten years. In Barbados and Belize aquaculture seems to be a fledgling sector.

Country	Average (Years)
BARBADOS	2.00
BELIZE	3.91
GUYANA	9.00
JAMAICA	10.54
SAINT KITTS AND NEVIS	11.00
TRINIDAD AND TOBAGO	9.20

Table 73. Average of years of the farms/facilities

Finance investments and business growth expectations

The aquaculture industry appears to be financed mainly by personal savings (Table 74). While partnership investments seem to be representative only in Belize. Guyana and Jamaica got financing mainly from bank credits. Likewise, Guyana got about 25% financing from the government. Businesses running with the source of foreign investments only have been observed in Belize.

Country	National bank loans	Partnership	Savings	Governmental assistance	Foreign investment	International cooperation
BARBADOS	0.00%	0.00%	0.00%	0.00%	0.00%	100%
BELIZE	2.50%	12.50%	70.00%	7.50%	5.00%	2.50%
GUYANA	25.00%	4.17%	41.67%	25.00%	0.00%	4.17%
JAMAICA	19.40%	2.24%	76.12%	1.49%	0.75%	0.00%
SAINT KITTS AND NEVIS	0.00%	0.00%	100%	0.00%	0.00%	0.00%
TRINIDAD AND TOBAGO	6.25%	0.00%	87.50%	6.25%	0.00%	0.00%
TOTAL	15.74%	4.17%	71.76%	5.56%	1.39%	1.39%

Table 74. Main sources of financing

Most of the companies surveyed have the will to continue working in the future and continue investing in the modernization, improvement or even enlargement of the facility mainly through the construction of new ponds.

Types of cultures used in CARICOM surveyed countries

Although the general lack of fresh water, along with high rates of evaporation, makes fresh water pond culture difficult, even on the larger islands, sufficient water is available to support aquaculture in some areas. In most of the small islands however, it will not be possible to practise inland aquaculture on a significant scale. Construction of ponds could be very costly if they have to be excavated to depths sufficient to provide adequate reserves of water to compensate for evaporation. In many areas the surface soil is not deep and the sub-surface is rock. Additional complications arise from the annual irregularity of rainfall and the frequent droughts; in some years water supplies will not be sufficient to provide for the normal dry season, let alone unforeseen droughts.

In spite of the above mentioned factors, it can be said from the Study that nearly all fish farming is fresh water pond culture, with only nominal amounts attributed to brackish water culture.

The low tidal range means that coastal brackish water ponds cannot be filled and drained by tidal exchange; pumps would be necessary. However, the low tidal range favours pumping as the height to which the water has to be pumped is minimal and high volume pumps with relatively small energy requirements could be used.

Rapid evaporation from large brackish water ponds would raise salinity to undesirable levels unless considerable amounts of water are exchanged regularly, as there is insufficient fresh water for dilution. Too frequent water exchange would mean that any nutrient fertilizers added to the ponds to increase productivity would be lost. Three facilities dedicated to the mariculture were found in Jamaica, and one in St. Kitts and Nevis.

Country	Type of aquaculture facility	Number of facilities
BARBADOS	Aquaculture, freshwater	1
BELIZE	Aquaculture, freshwater	35
GUYANA	Aquaculture, brackish water	3
	Aquaculture, freshwater	15
JAMAICA	Mariculture	3
	Aquaculture, brackish water	2
	Aquaculture, freshwater	110
SAINT KITTS AND NEVIS ²⁸	Mariculture	1
TRINIDAD AND TOBAGO	Aquaculture, freshwater	16
Total		186

Table 75. Number of facilities per type of facility

The use of production is almost limited to human consumption, except for Belize, where part of the production is intended for restocking (15.38%), Guyana (17.39%) and Jamaica (1.69%). Furthermore in Jamaica we can find some facilities that produce ornamental fish.

Regarding the level of exploitation of cultivation according to the following criteria (FAO Aquaculture Glossary 2008):

- **Extensive cultivation**, production system characterised by:
 - low control level (e.g. of the environment, feeding, predators, competitors, pathogens);
 - low start-up costs, low level technology, and low production efficiency (yield no higher than 500 kg/ha/year);
 - high dependency on climate and local water quality; and
 - use of natural waters (e.g. lagoons, bays, coves) and of natural organisms for aquaculture.
- **Semi-intensive cultivation**, production system characterised by:
 - average production of 0.5 to 5 t/ha/year;
 - with possible complementary low grade feed, alevin / juvenile fish stock levels caught naturally or by hatchery, regular use of organic or inorganic fertilizer, tidal or rain water supply and/or some exchange of water, basic water quality control; and
 - generally, in upgraded ponds, enclosures or simple cage systems.
- **Intensive cultivation**, production system characterised by:
 - production of up to 200 t/ha/year;

²⁸ From the survey results, it was observed that St. Kitts was operating a brackish water aquaculture plant, but during the validation workshop, the country's representative stated that the farm was devoted to mariculture.

- high control levels;
- high start-up costs, high level of technology and production;
- efficiency;
- independence from climate and local water quality; and
- use of artificial cultivation systems.

The Study shows that the majority of the facilities operate as extensive cultivation with the exception of Jamaica, where the 82% of facilities operate as semi-intensive cultivation. Both facilities of Barbados and Saint Kitts and Nevis are intensive as well as four in Belize, two in Guyana, seventeen in Jamaica and one in Trinidad and Tobago.

In almost all countries, the use of ponds is the most frequent type of installation in freshwater and brackish water cultivation. In Barbados, the unique facility uses tanks and the one in Saint Kitts and Nevis use raceways. We can also find tanks in Trinidad and Tobago, Belize, Jamaica and Guyana (in these last two there are also cages).

Country	Cages	Tanks	Raceways	Ponds	Others
BARBADOS		100%			
BELIZE		5.71%	2.86%	91.43%	
GUYANA	9.52%	9.52%		80.95%	
JAMAICA	8.33%	18.94%		70.45%	2.27%
SAINT KITTS AND NEVIS			100%		
TRINIDAD AND TOBAGO		26.32%		73.68%	
Total	6.22%	16.75%	0.96%	74.64%	1.44%

Table 76. Type of installation

Activity, productivity and profitability of aquaculture sector

The Mozambique tilapia (*Oreochromis mossambicus*) production rates higher than any other aquaculture activity in the region. The 6,070,774 mt / year of production represents 97.7 percent of the total production of the ten selected countries. Some species of tilapia can be cultivated in brackish or sea water. In fact, *O. mossambicus* was reported to stand as high a concentration of salt as 50 ppt, a concentration at which they are said not to reproduce. Culture can be carried out in cages or in brackish water ponds.

Country	Common name	Scientific name	1.Spawning (reproduction)	2. Hatcher y	3. Nurser y	4. Fattening to commerci al size	5. Broo d stock	DK/N A	Total general
BARBADOS	Red tilapia	<i>Oreochromis niloticus</i>	0	0	0	0	0	0	0
Total BARBADOS			0	0	0	0	0	0	0
BELIZE	Mexican mojarra	<i>Cichlasoma urophthalmus</i>	0	0	0	0	0	0	0
	Red tilapia	<i>Oreochromis niloticus</i>	0	0	0	5,476	0	0	5,476
Total BELIZE			0	0	0	5,476	0	0	5,476
GUYANA	Pacora	<i>Plagioscion surinamensis</i>	0	0	0	4	0	0	4
	Black Shrimp	<i>Penaeus schmitti</i>	0	0	11	26	0	0	37
	Blue tilapia	<i>Oreochromis aureus</i>	0	0	0	0	0	0	0

Country	Common name	Scientific name	1.Spawning (reproduction)	2. Hatcher y	3. Nurser y	4. Fattening to commercial size	5. Broo d stock	DK/N A	Total general
	Hassar	Hoplosternum littorale	0	0	0	0	0	1	1
	Jamaican Red Mullet		0	2	2	2	0	0	6
	Pacu (Tambaqui)	Colossoma macropmum	0	0	0	0	0	0	0
	Querriman		0	0	4	0	0	0	4
	Red tilapia	Oreochromis niloticus	0	2	205	6	0	60,002	60,214
Total GUYANA			0	4	226	42	0	60,003	60,274
JAMAICA	Angel fish	Pterophyllum altum	0	23,100	0	0	0	0	23,100
		Pterophyllum scalare	54,000	39,000	40,000	0	0	0	133,000
	Black tetra	Gymnocorymbus ternetzi	0	150	0	0	0	0	150
	Blue gourami	Trichogaster trichopteras	0	2,000	0	0	0	0	2,000
	Dwarf gourami	Colisa lalia	0	20,000	0	0	0	0	20,000
	Fighter	Batta splendens	4,000	4,850	0	0	0	0	8,850
	Gold fish	Carassius auratus	15,000	39,670	0	42,000	0	1,100	97,770
	Gold gourami	Trichogaster trichopterus	0	500	0	0	0	0	500
	Gourami	Malpulutta kretseri	0	1,650	0	0	0	0	1,650
		Osphronemus goramy	22,000	10,000	1,000	0	0	0	33,000
	Guppy	Poeciliareticulata	3,000	108,800	25,000	31,000	0	0	167,800
	Koi	Cyprinus carpio	119,000	18,720	25,000	50,004	0	5,500	218,224
	Molly	Poecilia latipinna	193,000	50,000	600	2,000	0	0	245,600
	Moon	Xiphophorus macalatus	0	0	0	0	0	300	300
	Mozambique tilapia	Oreochromis mossambicus	0	4,000,000	96	737,473	0	115	4,737,685
	Pacific shrimp	Penaeus vannamei	120	0	0	50	0	0	170
	Paradise	Macropodus opercularis	34,000	6,075	0	0	0	0	40,075
	Pearl gourami	Trichogaster leerii	10,000	6,000	0	0	0	0	16,000
	Pleco	Hypostomus spp	0	0	0	0	0	0	0
	Rainbow angel	Pterophyllum spp	0	10,700	0	0	0	0	10,700
	Rosy barb	Puntius conchonus	110,000	6,700	0	0	0	6,000	122,700
	Severum	Heros severus	20,000	10,000	0	0	0	0	30,000
	Swordtail	Xiphophorus helleri	35,500	90,000	0	0	4,000	0	129,500
	Tiger barb	Puntius tetrazona	0	32,000	0	0	0	0	32,000
Total JAMAICA			619,620	4,479,915	91,696	862,527	4,000	13,015	6,070,774
SAINT KITTS AND NEVIS	Tilapia	Oreochromis spp	0	0	0	0	0	20,000	20,000
Total SAINT KITTS AND NEVIS			0	0	0	0	0	20,000	20,000
TRINIDAD AND TOBAGO	Angel fish	Pterophyllum spp	10,000	0	0	0	0	0	10,000
	Black conch	Melongena melongena	0	0	0	0	0	1	1
	Coscarob	Cichlasoma taenia	1	0	0	0	0	0	1
	Couram	Trichogaster spp	0	0	0	600	0	0	600
	Fighter	Batta splendens	6,000	0	0	0	0	0	6,000
	Gold fish	Carassius auratus	6,000	0	12,000	0	0	0	18,000
	Guabine	Hoplias malabaricus	0	0	0	0	0	0	0
	Hassar	Hoplosternum littorale	1,007	0	0	1	0	0	1,008
	Hillary	Xiphoths Spp	6,000	0	0	0	0	0	6,000
	Koi	Cyprinus carpio	6,000	0	0	0	0	0	6,000
	Molli	Poecilia spp	0	14,000	0	0	0	0	14,000
	Neileri	Xiphoths Spp	0	0	0	0	14,00	0	14,000

Country	Common name	Scientific name	1.Spawning (reproduction)	2. Hatcher y	3. Nurser y	4. Fattening to commercial size	5. Brood stock	DK/N A	Total general
	Red tilapia	Oreochromis Niloticus	7	0	0	0	0	0	7
	Tilapia	Oreochromis spp	17	0	0	11	0	0	28
Total TRINIDAD AND TOBAGO			35,031	14,000	12,000	612	14,000	1	75,644
Total general			654,651	4,493,919	103,922	868,657	18,000	93,019	6,232,167

Table 77. Annual production (in metric tonnes) per specie.

The total value derived from the aquaculture sector in the selected CARICOM countries reach the amount of more than eight and a half million USD per year (Table 78).

Country	Common name	Scientific name	VALUE (\$ year)
BARBADOS	Red tilapia	Oreochromis niloticus	-
BELIZE	Crana	Cichlasoma urophthalmus	-
	Red tilapia	Oreochromis niloticus	204,569
GUYANA	Bashaw	Plagioscion surinamensis	-
	Black Shrimp	Penaeus schmitti	62,234
	Blue tilapia	Oreochromis aureus	-
	Hassar	Hoplosternum littorale	-
	Jamaican Red		-
	Mullet		-
	Pacu (Tambaqui)	Colossoma macropmum	-
	Querriman		-
	Red tilapia	Oreochromis niloticus	423,834
JAMAICA	Angel fish	Pterophyllum altum	927
		Pterophyllum scalare	253,037
	Black tetra	Gymnocorymbus ternetzi	86
	Blue gourami	Trichogaster trichopteras	23
	Dwarf gourami	Colisa lalia	17,280
	Fighter	Batta splendens	6,353
	Gold fish	Carassius auratus	67,046
	Gold gourami	Trichogaster trichopterus	105
	Gourami	Malpulutta kretseri	662
		Osphronemus goramy	48,384
	Guppy	Poeciliareticulata	17,119
	Koi	Cyprinus carpio	125,902
	Molly	Poecilia latipinna	12,534
	Moon	Xiphophorus macalatus	346
	Mozambique tilapia	Oreochromis mossambicus	6,210,534
	Pacific shrimp	Penaeus vannamei	829,440
	Paradise	Macropodus opercularis	22,689
	Pearl gourami	Trichogaster leerii	6,912
	Pleco	Hypostomus spp	-
	Rainbow angel	Pterophyllum spp	10,080
	Rosy barb	Puntius conchonus	11,866
	Severum	Heros severus	230

Country	Common name	Scientific name	VALUE (\$ year)
	Swordtail	Xiphophorus helleri	43,425
	Tiger barb	Puntius tetrazona	576
ST KITTS AND NEVIS	Tilapia	Oreochromis spp	51,852
TRINIDAD AND TOBAGO	Angel fish	Pterophyllum spp	3,096
	Black conch	Melongena melongena	201
	Coscarob	Cichlasoma taenia	929
	Couram	Trichogaster spp	464
	Fighter	Batta splendens	2,786
	Gold fish	Carassius auratus	7,430
	Guabine	Hoplias malabaricus	155
	Hassar	Hoplosternum littorale	16,254
	Hillary	Xiphophus Spp	1,858
	Koi	Cyprinus carpio	929
	Molli	Poecilia ssp	4,334
	Neileri	Xiphophus Spp	4,334
	Red tilapia	Oreochromis niloticus	10,836
	Tilapia	Oreochromis spp	106,595
Total			8,588,247

Table 78. Annual value of the production from aquaculture industry.

It is quite frequent that other activities apart from production are carried out in the facilities (Table 79).

Country	Processing	Packaging	Distribution	Others
BARBADOS	0%	0%	0%	0%
BELIZE	60%	0%	40%	0%
GUYANA	9%	9%	55%	27%
JAMAICA	9%	15%	72%	4%
SAINT KITTS AND NEVIS	100%	0%	0%	0%
TRINIDAD AND TOBAGO	6%	0%	88%	6%

Table 79. Percentage of aquaculture facilities in each country that carries out other activities.

The following Tables (Table 80, and 81) provide information concerning the income of the farm/facility (sales, subsidies/donations or other incomes, like partners investment for example), as well as the distribution, sum and structure of costs associated with its possession and maintenance, applicable duties and general economic outcome of the aquaculture activity.

Country	Answer (Pounds)	Total cost	Average
BARBADOS	Sales	8	8
	Subsidies / Donations	-	-
	Other income	-	-
BELIZE	Sales	3,274	234
	Subsidies / Donations	2	2
	Other income	51	17
GUYANA	Sales	5,775	577
	Subsidies / Donations	17	6
	Other income	10,717	3,572
JAMAICA	Sales	15,381	151
	Subsidies / Donations	-	-

Country	Answer (Pounds)	Total cost	Average
SAINT KITTS AND NEVIS	Other income	9,998	345
	Sales	37	37
	Subsidies / Donations	-	-
	Other income	-	-
	Sales	417	30
TRINIDAD AND TOBAGO	Subsidies / Donations	-	-
	Other income	464	464

Table 80. Daily incomes (USD)

Country	Answer	Total cost	Average
BARBADOS	Eggs and young fish	-	-
	Food	0.85	0.85
	Containers and packaging	-	-
	Other supplies	-	-
	Rentals	-	-
	Mortgage	-	-
	Amortization of tangible fixed assets	-	-
	Repairs and maintenance	-	-
	Transport	-	-
	Water supplies	-	-
	Other supplies (fuel, electricity, gas...)	0.65	0.65
	Staff costs	-	-
	National Social Security contribution	-	-
	Quality assurance system	-	-
	Security	-	-
	Other costs	-	-
BELIZE	Eggs and young fish	2,580.80	143.38
	Food	369.56	13.20
	Containers and packaging	8.28	8.28
	Other supplies	2.21	1.11
	Rentals	-	-
	Mortgage	-	-
	Amortization of tangible fixed assets	-	-
	Repairs and maintenance	215.19	43.04
	Transport	24.03	6.01
	Water supplies	1.75	1.75
	Other supplies (fuel, electricity, gas...)	131.67	18.81
	Staff costs	33.34	11.11
	National Social Security contribution	14.16	3.54
	Quality assurance system	-	-
	Security	30.79	15.39
	Other costs	7,322.04	563.23
GUYANA	Eggs and young fish	48.62	48.62
	Food	3,341.66	334.17
	Containers and packaging	19.93	19.93
	Other supplies	0.19	0.19
	Rentals	121.72	40.57

Country		Answer	Total cost	Average
		Mortgage	170,299.65	85,149.83
		Amortization of tangible fixed assets	21,879.00	21,879.00
		Repairs and maintenance	150,076.84	10,719.77
		Transport	1,105.78	221.16
		Water supplies	16.69	5.56
		Other supplies (fuel, electricity, gas...)	20.74	4.15
		Staff costs	4,029.48	575.64
		National Social Security contribution	-	-
		Quality assurance system	4.86	4.86
		Security	772.97	110.42
		Other costs	-	-
JAMAICA		Eggs and young fish	4,883.28	45.22
		Food	9,221.76	85.39
		Containers and packaging	280.63	11.69
		Other supplies	175.37	7.01
		Rentals	208.51	13.03
		Mortgage	386.69	55.24
		Amortization of tangible fixed assets	9.60	9.60
		Repairs and maintenance	396.02	14.14
		Transport	660.26	7.59
		Water supplies	553.57	7.01
		Other supplies (fuel, electricity, gas...)	2,451.53	35.53
		Staff costs	1,914.43	31.91
		National Social Security contribution	69.73	9.96
		Quality assurance system	79.10	26.37
		Security	433.15	48.13
		Other costs	452.74	15.61
SAINT KITTS AND NEVIS		Eggs and young fish	-	-
		Food	26.46	26.46
		Containers and packaging	-	-
		Other supplies	-	-
		Rentals	6.17	6.17
		Mortgage	-	-
		Amortization of tangible fixed assets	-	-
		Repairs and maintenance	37.04	37.04
		Transport	15.87	15.87
		Water supplies	3.70	3.70
		Other supplies (fuel, electricity, gas...)	4.94	4.94
		Staff costs	-	-
		National Social Security contribution	-	-
		Quality assurance system	16.77	16.77
		Security	-	-
		Other costs	-	-
TRINIDAD AND TOBAGO		Eggs and young fish	73.27	18.32
		Food	206.55	15.89
		Containers and packaging	5.99	2.99
		Other supplies	7.22	2.41

Country	Answer	Total cost	Average
	Rentals	-	-
	Mortgage	-	-
	Amortization of tangible fixed assets	-	-
	Repairs and maintenance	294.43	26.77
	Transport	6.19	2.06
	Water supplies	0.26	0.26
	Other supplies (fuel, electricity, gas...)	38.44	6.41
	Staff costs	225.16	32.17
	National Social Security contribution	-	-
	Quality assurance system	-	-
	Security	1.03	1.03
	Other costs	2,322.77	1,161.39

Table 81. Daily cost (USD)

What has been seen is that most aquaculture facilities do not operate at full capacity. Only Belize, Guyana and Jamaica reported to have a percentage (14, 24 and 32% respectively) operating at full capacity. On average, the aquaculture facilities are working at half their potential.

Another important factor is land-use. No facility in any country has received any government concession regarding the use of the land. Likewise, the owner of the business do not have to pay any taxes for it (with the exception of Jamaica, where they are paying an average of 856 \$/year).

As regards to the commercialization of aquaculture products, they are mainly sold in the local and national market but there are also a small percentage of exports at the regional level. Only Guyana and Jamaica export aquaculture products at an international level (in Guyana, more than 40% of the total aquaculture production).

Country	Restocking	Own consumption	Local market	National market	Regional export	International export
BARBADOS	0.00%	1.00%	99.00%	0.00%	0.00%	0.00%
BELIZE	4.72%	16.34%	29.55%	35.32%	18.79%	0.00%
GUYANA	5.23%	17.67%	31.50%	9.41%	0.00%	41.41%
JAMAICA	5.33%	2.13%	65.66%	0.00%	13.33%	18.88%
SAINT KITTS AND NEVIS	25.00%	6.25%	93.75%	0.00%	0.00%	0.00%
TRINIDAD AND TOBAGO	10.43%	26.21%	38.53%	35.26%	0.00%	0.00%
TOTAL	5.02%	13.69%	34.44%	22.61%	11.55%	17.71%

Table 82. Destination of the production

In Jamaica, almost the 60% of the production is sold directly to wholesales (48% in Guyana). In Belize, approximately the same percentage is sold directly to retailers. In the rest of the countries the marketing takes place without intermediaries, with the consumers being the first buyers.

Employment and Security System

In terms of the staff who work in businesses related to the aquaculture industry, in all countries the industry employs more full-time workers than part-time, in both cases most of the employers are men.

Almost all jobs have the status of semi-skilled or unskilled, regardless of sex. Seasonal staff occupies fewer skilled positions.

In Table 81 we can see the average of working hours by day, the days worked per month and the salaries that workers are paid.

		WOMEN			MEN		
		Hours /day average	Days/month average	Salary/month average	Hours /day average	Days/month average	Salary/month average
BARBADOS	Non-salaried staff	-	-	-	-	-	-
	Professional workers	-	-	-	-	-	-
	Skilled workers	-	-	-	-	-	-
	Middle services workers	-	-	-	-	-	-
	Semi-skilled workers	-	-	-	-	-	-
	Unskilled workers	-	-	-	-	-	-
Total		-	-	-	-	-	-
BELIZE	Non-salaried staff	1.33	23.83	-	3.86	28.42	-
	Professional workers	-	-	-	-	-	-
	Skilled workers	-	-	-	-	-	-
	Middle services workers	-	-	-	-	-	-
	Semi-skilled workers	4.00	12.00	71.51	-	-	-
	Unskilled workers	-	-	-	8.00	22.00	598.90
Total		1.71	22.14	71.51	4.04	28.10	598.90
GUYANA	Non-salaried staff	2.00	7.00	-	2.00	7.00	-
	Professional workers	6.00	8.00	729.30	8.00	24.00	850.85
	Skilled workers	4.00	20.00	1,507.22	7.00	12.00	72.93
	Middle services workers	4.00	20.00	97.24	8.00	24.00	510.51
	Semi-skilled workers	8.00	22.00	165.31	-	-	291.72
	Unskilled workers	7.00	21.00	194.48	5.00	21.00	194.48
Total		8.20	30.00	1,091.52	5.86	17.83	670.96
JAMAICA	Non-salaried staff	8.00	20.00	-	9.33	30.00	-
	Professional workers	-	-	-	5.00	30.00	705.60
	Skilled workers	-	-	-	5.00	13.50	336.96
	Middle services workers	-	-	-	8.00	30.00	305.28
	Semi-skilled workers	12.00	10.00	190.08	8.63	27.02	465.47
	Unskilled workers	7.50	23.50	720.00	8.36	28.22	1,245.66
Total		8.33	20.67	543.36	9.63	31.11	813.05
SAINT KITTS AND NEVIS ²⁹	Non-salaried staff	-	-	-	-	-	-
	Professional workers	10.00	30.00	-	-	-	-
	Skilled workers	-	-	-	-	-	-
	Middle services workers	-	-	-	-	-	-

²⁹ The survey results shows that in Saint Kitts and Nevis only one aquaculture plant was operating, and that 100% of the workers were women. During the validation workshop, the country's representative said that the aquaculture plant is operated by one man and that the labour force was made up of men and women working as volunteers.

		WOMEN			MEN		
		Hours /day average	Days/month average	Salary/month average	Hours /day average	Days/month average	Salary/month average
TRINIDAD AND TOBAGO	Semi-skilled workers	-	-	-	-	-	-
	Unskilled workers	-	-	-	-	-	-
	Total	10.00	30.00	-	-	-	-
	Non-salaried staff	2.20	10.20		2.85	21.62	
	Professional workers	8.00	30.00	309.60	7.00	25.00	774.00
	Skilled workers	7.00	20.00	541.80	6.67	26.67	774.00
	Middle services workers	-	-	-	-	-	-
	Semi-skilled workers	-	-	-	-	-	-
	Unskilled workers	-	-	-	-	-	-
Total		4.71	17.29	464.40	5.07	29.36	967.50

Table 83. Characteristics of Full-time employees by type and gender

The survey results indicate no clear seasonality for part-time contracts in the aquaculture industry. In general almost all companies of all countries have provided training courses to their workers, especially in Guyana and Jamaica. The main courses are related to fish husbandry practices and fish handling.

As for the existence of social benefits for companies engaged in aquaculture industry, analyzing the survey results it appears that in general, a high percentage of companies do not have any insurance contract, nor receive any type of subsidy by the government (except for Guyana, where 22% of companies had received it) or have not received any non-governmental assistance in the last five years.

When asked if the interviewee participates in a social security system that covers matters such as: family expenses (family payments and funeral assistance), illness, maternity, disability, old age, death, professional incapacity and survival, only found about 32% of beneficiaries in Belize and 24% in Guyana responded favorably. In Jamaica the figure is less than 11% of businesses and none were found in Trinidad and Tobago.

Presence of cooperatives

Except in Saint Kitts and Nevis (no respondent stated that he/she belonged to a cooperative or association), cooperatives seem to be present in all countries but very few aquaculture companies claimed to be part of any. Only in Belize and Jamaica were associations and cooperatives considered to be working well, in the rest of countries it seems that associations and cooperatives are not fully supported by members of the aquaculture sector.

In Belize and Trinidad and Tobago, cooperatives in the aquaculture sector mainly provide legal advice and training to the members of the aquaculture industry. In Barbados they are involved in the marketing process. In Jamaica and Guyana, cooperatives, in addition to being involved in marketing and providing training and legal advice, they also provide materials and fry / fingerling / food.

Knowledge of policy regulations

With regard to knowledge of the fishery policy, except in Guyana the majority of respondents of each country were not updated with in-force legislation concerning the activities of the aquaculture industry. In addition, extensive knowledge of each country's strategic plans for

the sector was not found, as only in Guyana did more than 40% of respondents knew its contents. Overall, the interviewed did not feel themselves as a participant in the decision making processes during the development of strategic plans for their sector.

Environmental concerns

Some of the unique environmental concerns faced by aquaculturists in the Caribbean include limited freshwater supply, sensitive island habitats, oligotrophic waters, and coral reefs. Therefore, when reviewing the environmental impact issues for aquaculture development in the Caribbean, it is important to cover potential habitat loss, resource depletion, introduction of non-native species, and eutrophication from nutrient waste. Developing appropriate Terms of Reference along with mitigation and monitoring procedures will aid governmental guidelines and regulatory parameters, while incorporating the aquaculture developer's needs for production. An environmental matrix that incorporates the culture species and systems considerations can be used for evaluating aquaculture development environmental impact issues, while providing an assessment guide for the government and the aquaculture developer³⁰.

As a result of the relationship of the aquaculture industry of the selected countries and the environment, without exceptions, there has not been observed a high involvement in wastewater³¹ treatment, neither in the solid waste generated during processing activity.

The main source of water supply used in the aquaculture industry is rainwater, except for Jamaica where 44% of facilities utilize an irrigation system and 26% benefits from the national supply system. The brackish water facilities of Guyana and Jamaica take water from the sea.

It should be noted that on average more than 88% of all businesses in the aquaculture industry do not carry out any wastewater treatment and more than 50 % are not re-circulating water. Only Guyana and Jamaica reported high percentages of facilities (50 and 71% respectively) using filters.

When the surveyors asked for the opinion of the interviewees about the environmental aspects that most influence the development of their productive activities, it was noted that the majority agree that the two main aspects are the quality of the water supply source and the quality of the water in the facility.

Main concerns from members of aquaculture sector

In order to detect the principal problems that the interviewee faces when carrying out aquaculture activities, either related to bureaucracy, access to loans, distribution/transport of the product, source water quality, control of invading species, lack of specialized staff, supply and maintenance, sales, destructive effects of natural disasters, praedial larceny, fulfillment of environmental requirements or any other problem, they were asked to score each problem from 1 to 5, depending on the severity of the problem:

³⁰ Pardee, M. and D. Davis.2006

³¹ Wastewater refers to the water that has been used for domestic or industrial purposes including land- based aquaculture. Wastewater from one user can be a potential supply to a user elsewhere. Cooling water is not considered to be wastewater (FAO. Aquaculture Glossary 2008).

- not at all important = 1
- not very important = 2
- neutral = 3
- important = 4
- very important = 5

The obstacles/problems ranked as very important were: bureaucracy, difficulties in gaining access to markets, to electricity and problems with supplies (generators, etc).

Main obstacles/problems	Ba	Be	Gu	Ja	KN	TT
Bureaucratic problems	5	2.1	3.6	3.1	5	4.9
Difficulty in gaining access to electricity	5	2.1	3.6	3.1	5	4.9
Difficulty in gaining access to water	1	3.1	3.0	3.6	1	3.6
Low quality of water	1	2.5	3.4	4.2	1	2.8
Supply problems (feeds, young fish, larvae)	1	3.0	3.1	4.6	1	2.7
Other supplies (generators, etc.)	3	4.0	3.7	4.7	5	4.4
Natural disasters (hurricanes, floods, etc.)	1	3.1	2.5	3.5	5	3.6
Invading species, diseases, etc.	1	2.9	2.5	3.7	1	3.1
Difficulties in finding specialised staff	4	2.6	3.5	3.5	1	3.9
Difficulties in gaining access to loans	1	3.1	3.4	3.1	5	4.6
Difficulties in gaining access to the market/marketing of the product	5	3.0	4.7	3.9	5	3.8
Difficulties in distribution/transport of the product	4	3.1	4.0	4.0	-	3.9
Praedial larceny	1	3.5	2.8	3.9	-	3.8
Fulfilment of environmental requirements (e.g. EIAs)	1	2.9	4.2	4.7	-	3.6

Table 84. Importance of the following obstacles/problems in terms of keeping the business running

The same process was carried out to find out what are, in the opinion of the interviewees, the strategic actions that would most benefit the development of their productive activity. There are several actions of varying nature: the locating of zones for installing aquaculture facilities, the development and transfer of technology, the improvements in health control and product quality, the speeding up of administrative procedures, the promotion of consumption of aquaculture products, the promotion of market opportunities for aquaculture products, the promotion of production and marketing organizations, the improvement of distribution/transport of aquaculture products, the control of food and water quality, the promotion of investment in aquaculture, the training of specialised technicians, the boosting of R&D&I (Research, Development and Innovation), the reduction of negative impacts on the environment, the design and implementation of an Action Plan and any others not included.

The actions ranked as much important were; training of specialized technicians, improvements in health control and product quality and the promotion of producers' organizations and market opportunities for aquaculture products.

Development actions	Ba	Be	Gu	Ja	KN	TT
Locating of zones and possibilities for the development of aquaculture	2	4.0	3.7	3.8	5	4,2
Development and transfer of technology	2	4.0	3.7	3.8	5	4,2
Improvements in health control and product quality	5	4.2	4.4	4.1	5	4,4
Speeding up of administrative procedures	5	4.3	3.8	4.2	5	4,0
Promotion of the consumption of aquaculture products	5	3.7	4.0	3.5	5	4,8
Promotion of market opportunities for aquaculture products	5	4.2	4.2	4.1	5	4,4
Promotion of producers' organizations	5	4.2	4.4	4.3	5	4,6
Improvement of distribution/transport of aquaculture products	5	4.2	4.0	4.2	5	4,5
Control of food and water quality	4	4.0	3.3	4.2	1	4,5
Promotion of investment in aquaculture	1	4.3	3.9	4.7	5	3,8
Training of specialised technicians	5	4.0	4.6	4.4	5	4,9
Boosting of R&D&i	3	4.1	4.3	4.0	5	4,8
Reduction of negative impacts on the environment	3	3.8	4.1	4.0	5	4,7
Design and implementation of an action plan	3	3.8	3.9	3.9	5	3,9

Table 85. Importance of development actions

10. Remarks on the processing industry

An advanced and profitable processing industry is critical to the economy of a country, as it economically adds value to the fisheries products and also is a major source of employment, especially for women and for individuals with low skills profile.

The processing industry has been installed in the countries of CARICOM for more than sixteen years. Specifically, in Belize, half of the businesses have been operating for 44 years. However in the last five years, new processing plants have only been opened in Grenada, Trinidad and Tobago and Guyana. Usually, owners of a processing business do not own the land where the plant is installed except in the Bahamas and Guyana, nor have any special concession by the government for land use.

Finance, investments and business growth expectations

The processing industry appears to be financed by domestic bank credit and personal savings. Also partnership investments seem to be representative in some countries such as the Bahamas, Belize, Grenada, Guyana, Jamaica and Trinidad and Tobago, as well as government assistance in Belize, Saint Kitts and Nevis and Saint Vincent and the Grenadines. Businesses running with the source of foreign investments only have been observed in Guyana.

The industry seems to be well established in the countries studied as most of the companies surveyed intended to continue working in the future and continue investing in the modernization of the company and the training of its employees to further enhance business productivity and profitability. However, some companies in Belize (33%), Grenada (3%), Guyana (25%), Jamaica (20%) and Barbados (14%) have indicated the intention to cease production in coming years.

As said before, the general trend of those interviewed is the interest in investing in modernization, enlargement and improvement of their business. In Jamaica and Saint Kitts and Nevis, all respondents had this intention, followed by Bahamas and Saint Vincent and the

Grenadines. In the rest of countries, between 64% and 66% of respondents also plan to invest in modernisation.

The business objectives of all countries are similar and are aimed at increasing productivity, either by expanding the facilities, diversifying the business, or through the modernization of plant equipment. Included among the upgrades of the facilities are the installation of freezers or cold rooms, improving fish drying systems, investing in machines for descaling fish, vacuum machines or investing in equipment for smoking products of fishing activity. In the case of Guyana, one establishment emphasized its interest in adapting the technology to achieve certification in the EU in order to export their products.

In general, almost all companies of all countries provide training courses to their workers, especially in the Bahamas, Grenada, Jamaica and Saint Vincent. The main courses are related to the proper handling of food and machinery and Hazard Analysis and Critical Control Points (HACCP).

Activity

What has been seen is that most processing plants do not operate at full capacity, either influenced by the seasonality of the fishing products, or due to other activities carried out such as packaging and distribution of fisheries products. Some plants are also involved in the packing and distribution of other foodstuffs (Table 86).

Only Belize and Grenada have more than 65% of their processing plants operating at full capacity. In other countries the plants, on average are operating at 30% of capacity. In the case of Barbados the average of businesses operation for processing is below 10%.

Country	Packaging	Distribution	Others
BAHAMAS	71.43%	71.43%	14.29%
BARBADOS	100%	55.56%	0%
BELIZE	100%	100%	33.33%
GRENADA	66.67%	66.67%	66.67%
GUYANA	100%	88.24%	29.41%
JAMAICA	60%	80%	0%
SAINT KITTS AND NEVIS	50%	75%	25%
SAINT VINCENT AND THE GRENADINES	75%	75%	50%
TRINIDAD AND TOBAGO	50%	37.50%	25%
Total general	76.47%	67.65%	23.53%

Table 86. Percentage of processing plants in each country that carries out other activities

With the exception of Belize and Saint Kitts and Nevis, most plants in the other states surveyed, do not have the capacity to supply their products throughout the whole year. The capacity to supply ranges between 20% and 66%.

As for the main fish species processed at the processing plants surveyed, there obviously exists a parallelism between the typical fisheries of each country or the main species bred in its aquaculture industry, and the most important species of the processing industry. With the exception of Barbados, Trinidad and Tobago and Saint Vincent and the Grenadines, the fisheries products are purchased in the national market for export after processing and packaging.

Productivity and profitability of the processing industry sector

A Study of the productivity and profitability of businesses based in the processing industry in these countries was not possible, since the data provided on quantities purchased, processed and sold expressed in mass units and in monetary units, were insufficient to allow for proper analysis and reliable conclusions. During the analysis of the processing sector surveys, it was discovered that in many cases no proportionality was observed between the weights and the purchase or sale price declared. It was suspected that different magnitudes of mass and currencies than those referred to in the survey were used, and these new magnitudes were not reflected in the paper. After the Validation Workshop, these cases were investigated and some of the missing information was obtained. Still, a large enough sample size was not achieved to draw any reliable conclusion.

Employment and Security system

Employment in the fish processing industry is affected by the closed periods of some fish species, migration, etc., with lay-offs during closed seasons and the hiring of extra staff during peak catch periods.

Regarding the existence of social benefits for companies engaged in the processing industry, an analysis of the survey results indicates that generally processing companies do not have any insurance contract, nor receive any type of subsidy by the government or have not received any non-governmental assistance.

In Barbados, Guyana, Jamaica, Saint Kitts and Nevis, Saint Vincent and the Grenadines and Trinidad and Tobago a significant percentage of companies did not have any kind of insurance. Generally, companies in the surveyed states appear not to have received any subsidy from the state in the last five years, except in Grenada, Guyana, Saint Kitts and Nevis and Saint Vincent and the Grenadines where between 50 and 66 percent of companies received some form of subsidy. Non-governmental financial assistance was received only in Saint Vincent and the Grenadines and Saint Kitts and Nevis.

In Belize, Jamaica and Saint Kitts and Nevis processing companies had a 100 per cent participation rate in a social security system. In the rest of the countries membership in a social security system ranged between 56 and 85 per cent, except in Barbados, where the participation rate was less than 50 per cent of businesses.

Presence of cooperatives

Except in Saint Vincent and the Grenadines, cooperatives seem to be present in all countries but very few companies claimed to be part of these cooperatives, except for Belize, Guyana and Saint Kitts and Nevis where there seem to be greater participation in such partnerships. The survey results indicated that only processing facilities in Belize fully supported the work of associations and cooperatives. The questionnaires from the remainder of the countries showed high abstention rates when requested to rate the work of cooperatives.

In the Bahamas and Guyana³², cooperatives mainly provide legal advice and training to the members of the processing industry. In Barbados they are involved in the marketing process and raw material supply. Grenada cooperatives, in addition to being involved in the marketing and raw material supply, also provide electricity and the use of preservation facilities. In Jamaica cooperatives are only involved in the supply of materials, while in Saint Kitts and Nevis they are concerned with the supply of materials and marketing. In Trinidad and Tobago they are in charge of marketing and provide legal advice and training.

Knowledge of Industry Policy and Regulations

With regard to knowledge of fishery policy, except in Barbados the majority of respondents of each country were up-to-date with in force legislation concerning the activities of the processing industry. However knowledge of each country's strategic plans for the sector was not as extensive. Only in Bahamas, Belize, Guyana and Trinidad and Tobago did more than 50 percent of respondents indicate knowledge of the contents of their countries strategic plan. Overall, except for members of the processing industry in Belize, Guyana, Grenada and Saint Vincent and the Grenadines, respondents did not feel themselves as part of the decision making process during the development of strategic plans for their sector.

Environmental Considerations

As for the relationship of the processing industry of the ten selected countries and the environment, with a few exceptions, there has not been observed a high involvement in wastewater treatment neither in the solid waste generated during processing activity.

The main source of energy used in the processing industry is electricity, and to a lesser extent fuel oil and gas. Regarding the use of renewable energy, it has been detected in Guyana a small percentage of businesses using solar energy.

Usually the raw material is not utilized for obtaining by-products, but some businesses in Barbados and Trinidad produce fish oils; in Guyana glue is manufactured and in Jamaica shells and operculum is exploited for jewellery or craft business.

It should be noted that on average more than fifty-three percent of all businesses of the processing industry did not undertake wastewater treatment of any kind, and that forty-five percent of them threw the generated solid waste on a garbage dump, or into the river or the sea. Nonetheless, this does not mean that in some cases there are not good environmental practices. In Guyana, eighty-seven percent of businesses subject wastewater to a physical process for the sedimentation of solid particles. In Belize, Grenada, Jamaica and Trinidad and Tobago around 30% of companies also submit their waste water to a primary treatment. In Grenada, 66% of the fish processing factories subject wastewater to biological treatments to consume organic matter. A small proportion of businesses in the Bahamas and Trinidad and Tobago also submit their wastewater to secondary treatment. No country had companies in the industry which submitted the water to tertiary treatment.

66% of Belize processing plants manage their solid waste through special solid waste packaging companies. A similar management occurs to a lesser extent in some companies of the Bahamas, Jamaica, Saint Vincent and the Grenadines and Trinidad and Tobago. The

³² Findings are based on results obtained from the surveys analysis. The CRFM made the following comment regarding this claim: In Guyana, cooperatives provide mainly goods and services to their members.

Bahamas processing industry also rely on companies responsible for collecting and managing toxic wastes. In Belize, Grenada, Guyana and Trinidad a part of solid waste is used as animal feed.

The hygiene and sanitary controls of raw materials are fully implemented in countries like the Bahamas, Belize and Jamaica. In Grenada and Guyana the implementation of these controls are held respectively by 66% and 87% of companies. In the remainder of the countries such checks are carried out in less than half of the companies surveyed.

Main concerns from members of processing sector

In order to detect the principal problems that the interviewee faces when carrying out processing activities, either related to bureaucracy, access to loans, distribution/transport of the product, difficulties in gaining access to electricity or water, lack of specialized staff, fulfillment of environmental requirements or any other problem, they were asked to score each problem from 1 to 5, depending on the severity of the problem according to the interviewee:

- not at all important = 1
- not very important = 2
- neutral = 3
- important = 4
- very important = 5

The obstacles / problems ranked as very important were: Difficulties in finding specialized staff and in waste water treatment.

Main obstacles/problems	T & T	JAM	St. K	St. V	BAH	GUY	BARB	BEL	GRE
Bureaucratic problems	3.31	3.80	1.25	3.50	4.43	2.94	0.44	2.33	3.67
Difficulty in gaining access to electricity	3.31	3.80	1.25	3.50	4.43	2.94	0.44	2.33	3.67
Difficulty in gaining access to water	1.94	2.60	2.00	2.00	2.43	2.88	4.67	1.33	4.67
Waste treatment	2.38	2.60	2.00	2.00	2.43	2.81	4.56	1.00	5.00
Problems regarding the supply of raw materials	1.56	3.40	2.25	1.50	2.71	4.13	0.22	2.00	3.67
Other supplies (generators, etc.)	3.06	3.20	2.50	3.50	3.29	4.44	2.22	2.33	5.00
Natural disasters (hurricanes, floods, etc.)	1.56	3.20	2.50	1.75	3.29	3.00	0.89	2.67	4.33
Difficulties in finding specialised staff	1.88	3.80	5.00	3.50	4.00	3.25	2.00	5.00	5.00
Difficulties in gaining access to loans	2.44	4.20	2.00	3.00	3.00	2.88	1.00	3.00	4.33
Difficulties in gaining access to the market/marketing of the product	2.06	4.00	1.25	2.50	2.71	2.44	0.22	3.67	3.33
Difficulties in distribution/transport of the product	2.50	4.60	3.75	3.25	2.86	3.75	1.67	3.33	5.00
Fulfilment of environmental requirements (e.g. EIAs)	2.56	3.80	2.75	3.25	3.00	3.19	0.89	2.33	5.00

Table 87. importance of the following obstacles/problems in terms of keeping the business running

The same process was carried out to find out what are, in the opinion of the interviewees, the strategic actions that would most benefit the development of their productive activities.

The actions ranked as most important were; speeding up administrative procedures; training of specialized technicians, development of transfer technology, improvements in health control and product quality, promotion and investment in processing industry, promotion of

the consumption of processed products; promotion of market and opportunities; promotion of producers' organizations and the design and implementation of action plans.

Development actions	T & T	JAM	St. K	St. V	BAH	GUY	BARB	BEL	GREN
Speeding up of administrative procedures	3.25	4.40	3.00	3.75	4.14	3.88	0.56	3.33	5.00
Training of specialised technicians	3.25	4.40	3.00	3.75	4.14	3.88	0.56	3.33	5.00
Development and transfer of technology	2.94	4.00	4.50	3.75	3.43	3.31	0.56	4.33	5.00
Improvements in health control and product quality	3.13	4.60	4.25	4.00	2.57	3.38	0.56	4.00	5.00
Promotion of investment in the processing industry	2.94	5.00	3.50	4.25	4.86	4.00	3.22	4.67	5.00
Promotion of the consumption of processed products	3.19	4.80	5.00	4.25	4.14	3.56	1.00	4.33	4.67
Promotion of market opportunities for fish processing products	3.88	4.60	4.75	4.50	4.29	3.06	1.00	5.00	5.00
Promotion of producers' organizations	3.88	4.40	4.75	4.75	3.86	2.88	2.56	4.33	5.00
Improvement of distribution/transport of fish processing products	2.75	4.40	3.25	3.75	3.29	2.38	0.56	4.33	4.67
Implementation of HACCP systems	3.56	4.80	4.25	4.50	4.29	2.56	1.67	3.33	4.67
Implementation of traceability systems	2.81	4.60	4.00	4.50	4.86	3.94	4.89	2.33	3.67
Implementation of quality certificates	2.69	4.60	2.75	4.00	4.71	3.81	0.56	4.67	3.67
Reduction of negative impacts on the environment	2.50	4.80	3.75	3.25	4.57	3.38	0.67	3.67	4.00
Boosting of R&D&i	2.50	4.80	3.75	3.25	4.57	3.38	0.67	3.67	4.00
Design and implementation of an action plan	2.63	3.60	3.25	5.00	3.43	3.00	0.56	3.67	3.33

Table 88. Importance of development actions

Remarks on the processing industry in each country

As mentioned before in the description of the fishing sector, in the Bahamas fundamental to the economics of the industry, is the exploitation of resources such as spiny lobster and queen conch, which are frozen to be later exported. The processing of various types of groupers such as Nassau grouper and yellow-edged grouper; lane snappers; and stone crabs are the other main objectives of the processing industry.

In the **Bahamas**, the raw material is purchased directly from local fishermen and boats that work for the factory. Raw material is also purchased from fishermen from other communities or imported. As regards to the commercialization of processed products, they are mainly exported either at a regional or international level. There are also sales in local and national market. Main international markets are Europe, USA and Canada.

In terms of the staff who works in businesses related to the processing industry, two types of workers can be distinguished, those working full time throughout the year, and those that work part-time due to the seasonality in the sector.

In general, most of the Bahamas full-time workers are men while most part-time workers are women. Women tend to occupy jobs between the semi-skilled levels to the professional ones, while more than half of men engaged in professional jobs (Table 89).

Type of employee	Women			Men			total
BAHAMAS	Hours /day average	Days/month average	% from total women	Hours /day average	Days/month average	% from total men	% from total workers
Non-salaried staff	4.57	3.33	7%	5.71	2.86	19%	17%
Professional workers	8.00	10.00	20%	10.57	14.86	58%	50%
Skilled workers	6.86	14.33	22%	2.57	5.71	2%	7%
Middle services workers	1.14	3.33	14%	3.43	4.00	3%	6%
Semi-skilled workers	2.29	6.67	36%	3.57	6.57	11%	17%
Unskilled workers	1.14	3.33	2%	1.14	3.43	5%	5%
Other Staff	-	-	0%	-	-	0%	0%

Table 89. Characteristics of full-time workers in the processing industry in the Bahamas

Normally part-time staff is composed of unskilled workers or semi-skilled ones and their working activity is higher between August and December (Table 90).

Type of employee	Women			Men			total
BAHAMAS	Hours /day average	Days/month average	% from total of women	Hours /day average	Days/month average	% from total of men	% from total workers
Non-salaried staff	1.00	1.43	1%	-	-	-	1%
Professional workers	-	-	-	-	-	-	-
Skilled workers	-	-	-	-	-	-	-
Middle services workers	-	-	-	-	-	-	-
Semi-skilled workers	4.0	5.71	41%	4.00	10.00	20%	35%
Unskilled workers	2.00	2.86	58%	4.00	10.00	80%	64%
Other Staff	-	-	-	-	-	-	-

Table 90. Characteristics of part-time workers in the processing industry in the Bahamas

The processing industry in **Barbados** focuses on the filleting of the principal fishing species in the country, the flyingfish and its top predator the dolphinfish. Large pelagics such as marlins, wahoo, billfish, swordfish and tunas in general, are also treated in these plants, being frozen or filleted.

In Barbados, the raw material is purchased directly from local fishermen, designated local fishermen and vessels working for the factory. Also raw material is purchased from intermediary agents. As regards to the commercialization of processed products, they are basically sold locally due to the abundance of small scale business, although there are some sales inside the national market. According to data from the survey, exports are almost nonexistent.

In Barbados, data only appeared for part-time workers and their information was incomplete. From these partial data obtained, it can only be said that workers are women doing the tasks of skilled workers or middle services workers³³. Part-time jobs abound from December to March (Table 91).

³³ It is presumed that Barbadian processing sector's workers are not exclusively women; lack of data is probably biasing gender information.

Type of employee	Women			Men			total
BARBADOS	Hours /day average	Days/month average	% from total of women	Hours /day average	Days/month average	% from total of men	% from total workers
Non-salaried staff	-	-	-	-	-	-	-
Professional workers	-	-	-	-	-	-	-
Skilled workers	4.00	-	50%	-	-	-	50%
Middle services workers	4.00	1.00	50%	-	-	-	50%
Semi-skilled workers	-	-	-	-	-	-	-
Unskilled workers	-	-	-	-	-	-	-
Other Staff	-	-	-	-	-	-	-

Table 91. Characteristics of part-time workers in the processing industry in the Barbados

The processing industry in **Belize** is based on the freezing of shellfish such as lobster, shrimp and stone crabs, and of the gastropod queen conch. Sea cucumbers are subjected to a salted process.

In Belize, the raw material is purchased directly from local fishermen. As regards to the commercialization of processed products, they are mainly exported at international level though there are also sales in local and national market. Main regional and international markets are Barbados and other CARICOM countries, USA, Mexico, Canada and Hong Kong.

In terms of the personnel who work in businesses related to the processing industry, in general, most of the Belizean full-time workers are women. No data has been found of existence of part-time workers. Women and men tend to occupy skilled and professional jobs though there are also men and women occupying middle service and semi-skilled jobs (Table 92).

Type of employee	Women			Men			total
BELIZE	Hours /day average	Days/month average	% from total of women	Hours /day average	Days/month average	% from total of men	% from total workers
Non-salaried staff	-	-	0%	2.67	8.00	15%	5%
Professional workers	8.00	18.00	9%	8.00	18.00	40%	20%
Skilled workers	5.33	10.00	26%	5.33	10.00	23%	25%
Middle services workers	2.67	2.00	4%	2.67	2.00	4%	4%
Semi-skilled workers	3.00	2.00	61%	3.00	2.00	19%	46%
Unskilled workers	-	-	0%	-	-	0%	0%
Other Staff	-	-	0%	-	-	0%	0%

Table 92. Characteristics of full-time workers in the processing industry in the Belize

The importance of ocean pelagic fishery is also reflected in **Grenadian** processing industry: yellow-fin tuna, albacore, black-fin tuna, blue marlin, Atlantic sailfish, wahoo and swordfish are frozen for both the export and the national markets. There is also a dedication to the freezing of the flying fish and dolphinfish and for various types of snappers, of which part of them are prepared or vacuum-packed.

In Grenada, the raw material is mainly purchased directly from local fishermen but there also exists direct purchase from boats that work for the factory and some imports. As regards to the commercialization of processed products, they are mainly exported at international level though there are also sales in the national market. All international exports are sold on the USA market.

In terms of the staff who works in businesses related to the processing industry, women and men tend to occupy skilled and professional jobs as well as middle service and semi-skilled jobs. In general, most of the Grenadian full-time and part-time workers are men. Women tend to occupy professional jobs or middle service jobs. Men are distributed throughout all job categories (Table 93).

Type of employee	Women			Men			total
	Hours /day average	Days/month average	% from total of women	Hours /day average	Days/month average	% from total of men	% from total workers
GRENADA							
Non-salaried staff	-	-	0%	-	-	0%	0%
Professional workers	8.00	23.67	56%	8.00	23.67	29%	41%
Skilled workers	-	-	0%	5.33	16.33	48%	27%
Middle services workers	8.00	23.67	38%	2.67	8.33	5%	19%
Semi-skilled workers	-	-	0%	-	8.00	5%	3%
Unskilled workers	2.67	8.33	6%	2.67	16.33	14%	11%
Other Staff	-	-	0%	-	-	0%	0%

Table 93. Characteristics of full-time workers in the processing industry in Grenada

In Grenada part-time jobs abound in March, April, May and September (Table 94).

Type of employee	Women			Men			total
	Hours /day average	Days/month average	% from total of women	Hours /day average	Days/month average	% from total men	% from total workers
GRENADA							
Non-salaried staff	-	-	-	-	-	-	-
Professional workers	-	-	-	-	-	-	-
Skilled workers	-	-	-	4.00	11.00	70%	70%
Middle services workers	-	-	-	-	-	-	-
Semi-skilled workers	-	-	-	-	-	-	-
Unskilled workers	-	-	-	4.00	4.00	30%	30%
Other Staff	-	-	-	-	-	-	-

Table 94. Characteristics of part-time workers in the processing industry in Grenada

In **Guyana**, the industry is dominated by the processing of prawns such as seabob and white belly shrimp that can be headed, peeled and frozen or may be commercialized as salted. Green weakfish (*Cynoscion virescens*) and bangamary (*Macrodon Ancylodon*) frozen and filleted are also important, as is the processing of several catfishes (Ariidae); jacks (Carangidae) and snappers (Lutjanidae).

In Guyana, the raw material is purchased directly from local fishermen and boats that work for the factory. Also raw material can be purchased from fishermen from other communities, and from aquaculturists. As regards to the commercialization of processed products, they are mainly exported either at a regional or international level. There are also sales in local and national markets. Main regional markets are Barbados, Trinidad and Tobago and other CARICOM countries, and at the international level Hong Kong, USA, Europe and Canada.

In terms of the staff working in businesses related to the processing industry, in general, most of Guyana's full-time workers are men, while most part-time workers are women. In Guyana, almost all jobs have the status of semi-skilled or unskilled, regardless of sex, although 80% of women carry out tasks of unskilled staff (Table 95).

Type of employee	Women			Men			total
	Hours /day average	Days/month average	% from total of women	Hours /day average	Days/month average	% from total of men	% from total workers
GUYANA							
Non-salaried staff	-	-	0%	0.19	-	0%	0%
Professional workers	2.13	6.06	1%	1.88	3.94	2%	1%
Skilled workers	1.13	4.81	1%	0.53	3.00	16%	9%
Middle services workers	1.63	3.94	10%	2.13	5.13	19%	15%
Semi-skilled workers	5.06	11.88	8%	4.06	11.50	15%	12%
Unskilled workers	5.00	14.75	80%	4.88	12.81	47%	63%
Other Staff	0.13	1.50	0%	0.75	1.75	0%	0%

Table 95. Characteristics of full-time workers in the processing industry in Guyana

In Guyana part-time jobs abound in May, September, October and November (Table 96).

Type of employee	Women			Men			total
	Hours /day average	Days/month average	% from total of women	Hours /day average	Days/month average	% from total of men	% from total workers
GUYANA							
Non-salaried staff	-	-	-	-	-	-	-
Professional workers	-	-	-	-	-	-	-
Skilled workers	-	-	-	-	-	-	-
Middle services workers	-	-	-	-	-	-	-
Semi-skilled workers	1.13	1.50	9%	1.29	2.86	29%	16%
Unskilled workers	5.88	8.69	91%	5.71	15.43	71%	84%
Other Staff	-	-	-	-	-	-	-

Table 96. Characteristics of part-time workers in the processing industry in Guyana

In **Jamaica**, spiny lobster and queen conch processing dominate as these are the most profitable species in the industry. The lobster and the conch are frozen, prepared or vacuum-packed. The processing of various types of snappers and parrotfishes are also important.

In Jamaica, the raw material is purchased directly from local fishermen and boats that work for the factory and from designated local fishermen. Also raw material can be purchased from fishermen from other communities, or can be imported. With regards to the commercialization of processed products, they are mainly exported either at a regional or international level, with sales also in local and national market. There seems to be quite an important international export market for fisheries product belonging to the category of non-human consumption. Main regional exports are directed to the French Antilles, USA and China.

In Jamaica a higher number of male workers than women was observed in the processing industry, although it is noteworthy that most women occupy technical positions or with some responsibilities. Women working in terms of seasonality occupy less skilled positions (Table 97).

Type of employee	Women			Men			total
JAMAICA	Hours /day average	Days/month average	% from total of women	Hours /day average	Days/month average	% from total of men	% from total workers
Non-salaried staff	2.00	11.00	2%	1.60	8.80	10%	7%
Professional workers	6.00	12.75	23%	4.80	10.20	10%	14%
Skilled workers	2.00	0.25	55%	3.20	6.20	42%	46%
Middle services workers	2.00	5.00	2%	1.60	4.00	1%	2%
Semi-skilled workers	-	-	0%	1.60	4.00	6%	4%
Unskilled workers	6.00	14.00	18%	6.40	13.25	31%	26%
Other Staff	-	-	0%	-	-	0%	0%

Table 97. Characteristics of full-time workers in the processing industry in Jamaica

In Jamaica part-time jobs abound in February, July, August and November (Table 98).

Type of employee	Women			Men			total
JAMAICA	Hours /day average	Days/month average	% from total of women	Hours /day average	Days/month average	% from total of men	% from total workers
Non-salaried staff	-	-	-	-	-	-	-
Professional workers	-	-	-	-	-	-	-
Skilled workers	2.67	6.00	43%	5.33	16.67	58%	51%
Middle services workers	2.67	6.00	9%	5.33	16.67	21%	15%
Semi-skilled workers	-	-	-	-	-	-	-
Unskilled workers	8.00	12.40	48%	8.00	20.67	21%	34%
Other Staff	-	-	-	-	-	-	-

Table 98. Characteristics of part-time workers in the processing industry in Jamaica

In **Saint Kitts and Nevis** there is also a processing industry for spiny lobster and queen conch. Dolphinfish, hinds, parrotfish, snappers and large pelagic species such as king mackerel or wahoo are frozen before being sold.

In Saint Kitts and Nevis the raw material is purchased directly from local fishermen and boats that work for the factory and from designated local fishermen. Also raw material can be purchased from fishermen from other communities. As regards to the commercialization of processed products, they are mainly sold in the local and national markets but there are also some exports at the regional level to the French Antilles.

The processing industry in Saint Kitts and Nevis employs more women than men, but while all men occupy skilled jobs, almost all women hold low-skilled job (Table 99).

Type of employee	Women			Men			total
ST KITTS & NEVIS	Hours /day average	Days/month average	% from total of women	Hours /day average	Days/month average	% from total of men	% from total workers
Non-salaried staff	-	-	0%	-	-	0%	0%
Professional workers	2.67	7.33	10%	8.67	20.00	50%	25%
Skilled workers	-	-	0%	3.67	8.33	50%	19%
Middle services workers	-	-	0%	-	-	0%	0%
Semi-skilled workers	6.67	18.00	80%	-	-	0%	50%
Unskilled workers	1.33	2.00	10%	-	-	0%	6%
Other Staff	-	-	0%	-	-	0%	0%

Table 99. Characteristics of full-time workers in the processing industry in St Kitts & Nevis

In **Saint Vincent and the Grenadines** eviscerate processing industry focuses on pelagic species but also on snappers. Among the pelagic fishes processed abounds the dolphinfish and large pelagic such as barracuda, wahoo, black-fin tuna and other tunas.

In Saint Vincent and the Grenadines, the raw material is purchased directly from local fishermen, from the market or also can be imported. As regards to the commercialization of processed products, they are mainly sold in the local and national market with also a small percentage of exports at the regional level to Barbados and Antigua and Barbuda.

The processing industry in Saint Vincent and the Grenadines employs more women than men, with most women performing unskilled jobs (Table 100).

Type of employee	Women			Men			total
	Hours /day average	Days/month average	% from total of women	Hours /day average	Days/month average	% from total of men	% from total workers
ST VINCENT & GRENADINES							
Non-salaried staff	-	-	0%	-	-	0%	0%
Professional workers	3.33	6.67	4%	5.00	6.67	13%	6%
Skilled workers	-	-	0%	-	7.22	25%	6%
Middle services workers	7.22	-	12%	-	-	0%	9%
Semi-skilled workers	3.67	2.67	16%	4.00	2.00	25%	18%
Unskilled workers	-	0.67	68%	-	7.22	38%	61%
Other Staff	-	-	0%	-	-	0%	0%

Table 100. Characteristics of full-time workers in the processing industry in St Vincent & Grenadines

In Saint Vincent and the Grenadines seasonality only runs from March to April (Table 101).

Type of employee	Women			Men			total
	Hours /day average	Days/month average	% from total of women	Hours /day average	Days/month average	% from total of men	% from total workers
ST VINCENT & GRENADINES							
Non-salaried staff	-	-	-	-	-	-	-
Professional workers	-	-	-	-	-	-	-
Skilled workers	-	-	-	-	-	-	-
Middle services workers	-	-	-	-	-	-	-
Semi-skilled workers	8.00	1.25	100%	-	-	-	100%
Unskilled workers	-	-	-	-	-	-	-
Other Staff	-	-	-	-	-	-	-

Table 101. Characteristics of part-time workers in the processing industry in St Vincent & Grenadines

In **Trinidad and Tobago** a portion of the processing industry is dedicated to the processing of lobsters, shrimps, squids, clams and other bivalves that can be frozen, prepared or vacuum-packed. Among the fish species processed, the most important are catfishes such as the bassa, red snappers, white-mouth croakers and pelagic species such as king mackerel, Serra spanish mackerel (carita), flying fish, dolphinfish, marlin, yellowfin tuna and swordfish. There is also a significant industry around the processing of tilapia.

In Trinidad and Tobago most of the raw material is imported, although some is purchased directly from local fishermen, designated local fishermen and vessels working for the factory. Also raw material is purchased from intermediary agents and fishermen from other communities. As regards to the commercialization of processed products, they are mainly sold in the local and national market, with some exports at the regional and international level to Barbados, Grenada and other CARICOM countries and to USA and Canada.

In general, most of the Trinidad and Tobago full-time and part-time workers are women. Women tend to occupy jobs between the semi-skilled levels to the professional ones (Table 102).

Type of employee	Women			Men			total
	Hours /day average	Days/month average	% from total of women	Hours /day average	Days/month average	% from total of men	% from total workers
TRINIDAD & TOBAGO							
Non-salaried staff	-	-	0%	-	-	0%	0%
Professional workers	4.00	11.50	8%	6.67	19.29	10%	9%
Skilled workers	4.00	13.63	12%	5.71	19.29	41%	25%
Middle services workers	3.00	11.00	28%	3.43	6.57	17%	23%
Semi-skilled workers	5.00	8.75	39%	5.71	16.00	30%	35%
Unskilled workers	2.00	5.25	13%	2.29	6.57	2%	8%
Other Staff	-	-	0%	-	-	0%	0%

Table 102. Characteristics of full-time workers in the processing industry in Trinidad & Tobago

In Trinidad the bulk of seasonality runs from January to June (Table 103).

Type of employee	Women			Men			total
	Hours /day average	Days/month average	% from total of women	Hours /day average	Days/month average	% from total of men	% from total workers
TRINIDAD & TOBAGO							
Non-salaried staff	-	-	-	-	-	-	-
Professional workers	-	-	-	1.40	5.00	4%	2%
Skilled workers	4.00	0.73	17%	-	-	-	10%
Middle services workers	-	-	-	-	-	-	-
Semi-skilled workers	1.60	-	62%	4.80	15.33	65%	63%
Unskilled workers	3.20	1.60	21%	3.20	8.00	30%	25%
Other Staff	-	-	-	-	-	-	-

Table 103. Characteristics of part-time workers in the processing industry in Trinidad & Tobago

IV. RECOMMENDATIONS: TOWARDS POVERTY REDUCTION IN FISHING COMMUNITIES

Poor people tend to be the most dependent upon the environment and the direct and indirect use of natural resources, such as the coast, and therefore are the most severely affected when the environment is degraded or their access to natural resources is limited or denied. Not only are their economic activities linked to these access issues, but their ability to engage in economic activities can be affected by poor environmental quality and the resulting impact on their health.

The poor suffer most when water, land and the air are polluted, and environmental risk factors are a major source of health problems. They are also extremely vulnerable to environmental hazards such as climate change induced sea level rise, and environment-related conflicts for example access rights to fishing quotas. However the coastal environment also provides many opportunities for poor communities to improve their livelihoods. For example, if access rights for natural resource assets can be secured, then these assets, if sustainably used, can generate long term economic gain, as can other indirect resource based activities such as tourism. It is therefore necessary to ensure a balance between stimulating economic growth on the coast whilst maintaining the environmental quality of the coast if we want to see poverty sustainably reduced.

The depletion of both agricultural and aquatic (fish) resources in the Caribbean means that there is a need to identify alternative livelihood strategies for those poor communities who depend on these resources for a living. Exploring alternative ‘sustainable’ livelihood strategies in a holistic and participatory manner should be considered a high priority.

Nevertheless it is important to take into account the fact that poverty in fishery-dependent communities is not necessarily directly – or only – related to the resource or catch levels. For example, although resource overexploitation may be a major cause of impoverishment for fishing communities, extreme poverty can also be observed in remote fishing camps where fishers catch and trade reasonable volumes of fish, but where communities lack access to health and other public services and are politically un-represented.

11. Recommendations

11.1 Recommendations related to the improvement of policy processes³⁴

The way that policy content is discussed and defined (i.e. the policy process) may affect how issues of poverty are addressed. In particular, including poor and food-insecure fishers and fishworkers in the policy process is likely to improve the potential for pro-poor content of policy. In striving to improve policy processes, States should:

- carefully identify all small-scale fisheries stakeholders that need to be involved in policy formation;
- consider the need for legislation and/or formalization of processes to ensure appropriate involvement by small-scale fisheries interests;

³⁴ From FAO. 2005. Increasing the contribution of small-scale fisheries to poverty alleviation and food security

- allow sufficient time and financial resources to ensure wide stakeholder participation in policy development;
- formalize methods to ensure transparency i.e. full disclosure of information on the extent of the involvement by different parties, and reasons for inclusion and exclusion of particular issues in policy documents, the selection of key priorities, and the processes used;
- decentralize policy processes, to increase both the potential for involvement of small-scale fishers and fish workers, but also accountability by bringing decision-making closer to the people;
- work with small-scale fisheries organizations to strengthen the ability of their representatives to participate meaningfully in the process;
- adapt and specify policy development tools (e.g. workshops, meetings, Participatory Rural Appraisal [PRA]) to encourage contributions to be made by small-scale fishers and other fish workers, by catering for the different educational levels and experiences by those involved in technical issues;
- make specific use of the knowledge and experience of small-scale fishers and fishworkers;
- conduct regular reviews and analysis of policies (to assess their impacts on small-scale fisheries), and of policy processes (to assess the extent to which small-scale fisheries interests are being included); and
- consider how fisheries policy development can be linked to the specification of national poverty reduction strategies and Poverty Reduction Strategy Papers (PRSPs).

Policy statements should cover and provide support for four broad categories of key objectives that should be considered for inclusion in fisheries policy, relating to environmental, economic, social, and equity concerns.

11.2 Recommendations related to social issues

Social security

It should be noted from the Study that more than half of the fisher-folk interviewed were not participating in a social security system.

A Fishermen's Pension and Social Security Benefit Scheme should be established within a legal framework.

The main objectives of the scheme should be:

- To provide social security to fisherfolk during old age or disability to them and their families
- Provide relief to dependents in the event of death of fishermen

- Encouraging the fishermen to continue in the fishing industry
- To attract young persons to the fishing industry
- Promote the habit of saving and thrift among fishermen.

Credit facilities

A high percentage of fishermen interviewed claims that they would invest in improving their fishing activities if they had easy access to credit.

Access to the credit for small-scale fishery, continues to be difficult, for example: a limited number of financial institutions, difficulties of answering to the requirements and the pre-conditions access, mainly those related with the provision of real warranties and shares, etc.

The problems and constraints that limit access of the small-scale fishers to financial services are weaknesses to carrying out investments, which constitute a serious derrent to his development.

The supportive guaranty could be one way of changing commercial banks and some registered credit institutions behaviour, and making credit more accessible for small-scale fishers. The support model of loans in groups (for instance, associations and/or committees) could be a way to reduce the operational costs of the financial institutions; on the other hand, these fishermen associations or commissions would still require guarantees. Like this, the financial institutions will be minimizing a loan risk, through loans in-group and supportive guaranty, simultaneously.

The aim is to increase more and cheaper credit for artisanal fishermen, in the long run. This fact will also create possibilities of making a living outside fisheries, and the pressure on the fishery will be reduced; probably, the overcapacity consists of labour or employment, which is easier to replace in cases in which alternative employment possibilities exist, for instance, agriculture, trader, etc.

A financial support plan should be developed and introduced, in strong collaboration with related financial agencies and governments, to provide fisherfolk and fisher's organizations with access to credit for investment in responsible fishing gear and technologies, safety gear and safer practices.

The financial plan should include micro-finance schemes, although micro-credit is a social development and political issue and sometimes it is not a financial / economic issue because the resource rents tend to be nought. According to Muhummad Yunus, "Micro-credit is a goal to fight against the poverty, because through the credit, the poor can improve their socio-economic conditions".

11.3 Recommendations related to education and skills

Education and training are the main methods of capacity building for community members and government.

Although the results on the level of education of fishermen have broken, in a sense, the stereotype of the high level of illiteracy in the fisheries sector, the percentage of individuals who have received any type of fishery training is still quite low in all countries.

Education and training methods, formal and informal, include small-group work, seminars, cross visits, role-playing, radio, video and fisher-to-fisher sharing of local knowledge.

In order to improve the sector training, it would be necessary to implement a training program aimed, firstly, at trainers in the field of administration (planning and management issues), professionals/graduates (in Oceanography, Biology, Marine Ecology and Aquaculture), fishermen's associations (in practice of navigation, fishing, use of technology, safety on board, handling and safety of fishery products, management of associations, self-management) and business associations (in food handling and hygiene, management of associations, accounting).

The program should be designed in various training modules, based on the objectives and training needs identified and the target audience. It will be also implemented using the methodology and the most suitable material to achieve the objectives.

Under the training program, study visits to other countries and seminars at regional and international levels could be scheduled.

In addition to training, it is necessary to raise the sector awareness on relevant issues that directly affect its activity, such as resource protection/conservation, the need for team management, participation in decision-making process, etc. This awareness can be accomplished by holding workshops and, if appropriate, by distributing leaflets or other graphic materials adapted to suit the varying degrees of literacy.

Education is a priority goal for the development of the fisheries sector as is the building of community members' and government officials and staffs capabilities and confidence so they can make informed choices and decisions about problem articulation, management and development objectives, strategies and plans, and implementation.

11.4 Recommendations related to impact on economy

Fish may be one of the few products in some rural economies that can generate cash to spur and stimulate demand. Direct impacts of the fishing activity on the economy are related to sales, and to income and employment effects on the producers themselves.

Fishing, where exercised as a commercial activity (i.e. not simply as an immediate source of protein for the fisher and his family), is subject to market forces and the catcher is almost always at a disadvantage. The product is highly perishable, access to a large number of buyers is difficult to achieve and there are real or perceived readily available alternatives. This is particularly so with regard to small scale fisheries.

Improvement in the fishery products market structure is considered a prime objective. To make improvements, certain infrastructures that facilitate the marketing of fishery products from their landing points to the country's major markets must be put into action. Amongst

others, docks, markets, refrigerated storage and processing areas all need building or renovating.

Marketers' organisational structure needs reinforcing and the several agents should be registered and use well-defined marketing channels.

Also, inland distribution must be improved by extending distribution channels allowing fish to reach as many inland areas as possible in the best condition.

Suitable conservation will minimise value loss. Measures designed to reduce post-capture loss may include the use of key material resources for guaranteeing the cold chain: (packaging, ice-makers, refrigerated storage and transport); awareness and training in the use of suitable hygiene practices through distribution of best practices guides; application of product inspection systems; application of analysis and critical control point systems (HACCP) from capture to retail and the enabling of processing alternatives through practical training workshops.

It is necessary to ensure a regular supply of fish to facilitate the organization of the market. In this regard, the professionalization of the sector and the return of profits will contribute to mitigating the seasonality of supply and to an increase in landings in the country.

In addition to strengthening the infrastructure necessary for fishery development and management, certain basic infrastructures will need reinforcing, building or maintaining, such as paved roads to improve access and facilitate inland distribution.

To facilitate exports, organisation limitations must be overcome and a favourable climate for private investment in the fishery sector created. To do so, the country's legal, fiscal and administrative frameworks should be adjusted. On the other hand, improvements to conditions for valuing fishery products, as well as health and quality controls—in compliance with international quality and sanitary and hygiene standards—will greatly increase hygiene and sanitary safety of the product, thus increasing opportunities to export.

A market analysis would provide information on use of the resource and the market and new market opportunities.

11.5 Recommendations related to the improvement of fisheries management

Fisheries management should promote the maintenance of the quality, diversity and availability of fisheries resources in sufficient quantities for present and future generations in the context of food security, poverty alleviation and sustainable development. Code of Conduct (FAO, 1995) under the General Principles in Article 6.2.

The administration in charge of managing fisheries should aim: to monitor fishing effort and enforce fishing regulations (MCS); to monitor fish stocks and advice on appropriate levels of exploitation of major commercial stocks; to report on the volume and value of production in the sector; to inform and instruct fishers on new technology through extension services.

Suitable resource management

If Caribbean countries are to manage their fisheries resources properly, they must improve their knowledge of the nature and exploitation level of those resources in order to implement and develop fishery management plans. This knowledge can be extended by fostering fishery research and regular information collection.

Recovery of overfished stocks will require lowering fishing pressure through diversification and displacement of fishery efforts towards less exploited areas and stocks beyond the continental shelf. It must be done by the national hand-fishing fleet and the semi-industrial and advanced fleets using techniques adapted to the country's prevailing socio-economic and environmental protection conditions. This modification of fishery strategy will be achieved by increasing fishery of ocean species as well as some species of tuna. To provide easier access to these under-exploited stocks, the fleet can be supplied with more efficient fibreglass vessels and equipped with engines, preservation systems, and navigation and communications equipment.

Assessment and management of overcapacity and IUU

Concern over issues of fleet overcapacity and IUU (illegal, unreported and unregulated) fishing tends to concentrate on industrial fishing. However, it should be noted that such issues also apply to, and affect, the sustainability and economic efficiency of small-scale fisheries, reducing or even jeopardizing their capacity to contribute to poverty alleviation.

One important consideration needs to be made in this regard: due to the nature of small-scale fishery activities (as part of a multi-activity livelihood strategy), there is the need to preserve a certain degree of flexibility to adapt to the seasonality of alternative economic activities. Outright reduction of overcapacity in small-scale fisheries (e.g. through a reduction in the total number of fish nets) may not be particularly relevant and may unnecessarily impact on poor fishers. In contrast, the removal of all subsidies on the acquisition of capital assets would be one way of discouraging the growth of effort.

Monitoring, control and surveillance

Monitoring, control and surveillance (MCS) is an integral part of effective fisheries management. The purpose of MCS is to ensure that fisheries policy and management measures are implemented and that they are, and remain, appropriate in the circumstances that ascertain at the time. An MCS system is essential for guaranteeing the maintenance of rights as, without the assurance that others will respect them, the rights would cease to exist and there would be a return to open access.

In general, fishers will more readily comply with laws and regulations which they consider legitimate. Thus the greater the involvement of fishers and other stakeholders in the process of formulating and implementing rules; the greater the ownership of them is likely to be, leading to more ready compliance.

There is no unique, correct design for MCS systems. Each MCS system needs to be tailored to the specific characteristics of the fishery, including those of the communities involved in the fishery, the gear and methods used and organization of the fishery. These are likely to vary substantially from fishery to fishery.

Reinforcing inspection, control and monitoring activities is essential for controlling the implementation of marine resource protection measures. The Fishery Law must define the infractions and sanctions related to the activity. Improvement to fishery control and surveillance operations will also be done by adopting new technical means such as satellite monitoring of vessels.

Proper implementation of Monitoring, Control and Surveillance (MCS) activities will ensure the high level of illegal fishing (IUU) is stopped in the short term. Fishery patrols and surveillance, applying the law in fishery areas and the future development of a full, final, agile, efficient and effective MCS system will put an end to illegal fishing.

Data collection and Fisheries Information Systems

To properly manage fishery resources, good knowledge of their status and evolution is required. This is obtained through a permanent programme of information capture within the framework of a fishery information system. To implement such a system, the fishing boat must be defined as an information collection and fishery capacity control unit. All catch data collected (amounts, fishery areas, etc.) and control measures applied after evaluation of the data will be based on this unit. It is therefore essential to compile a census of all fishing boats and their characteristics in an official register.

As a first measure of control, the right to carry out fishing activities must be restricted to registered boats. The sum of all GTs (Gross Tonnage) of boats in the census must be limited to the available fishery resources. This measure quantifies a vessel's fishing capacity and, although it is difficult to be precise, capacity can be estimated as a function of overall length, beam and depth.

Secondly, issuance of fishing licences in waters of Caribbean countries must be done in an orderly manner. The licences issued must be registered in the information system, although linked to a specific management condition (such as the delivery of information on catches and fishing efforts). Thus, it is essential to define a systematic data capture system - Data Collection- encompassing all information sources. These sources must be capable of being interrelated. The basic information is described below:

- Fishing capacity: this information is collected directly from the fishing boat register.
- Catch information: a sample-based system of information capture could be established.
- This system is mostly used by fleets of small vessels that unload at numerous points along the coast. It consists of selecting a representative sample from vessels during a specific period of time (usually a monthly sample) and analysing the composition and characteristics of the catch.
- Biological parameters: the sample programme for biological data collection must be designed for a specific period of time, usually a year. It consists of taking biological samples of the fish caught (age, weight, size, sex, and sexual maturity mainly). This information should provide an estimate of the status of the available resources which, when compared with the catch and fishery capacity data, allow forecasts of the future

status of the fisheries to be made and consequently the necessary protection measures to prevent possible overfishing to be taken.

- Socio-economic data: this kind of information is captured through surveys among the various agents in the fishery sector. The surveys must be based on samples chosen by a valid sampling method.

The lack of sufficiently qualified personnel for processing, analysing and interpreting the statistics on catches and efforts must not impede starting this activity. For collecting biological data, sufficient personnel trained in fishery management are required, as well as a network of samplers to cover the territory. Technical, financial and logistic support would have to be made available for these data capture operations.

Institutions

Fisheries management institutions must deliver the policy through the formulation of legislation, regulations and by ensuring their implementation. Thus, the effectiveness of fisheries management institutions is highly dependent on how appropriate they are given the particular circumstances of the fishery. Decentralized management of fisheries is likely to enhance the possibilities of management being more sensitive to issues of poverty.

Where local capacities are present (e.g. through existing local professional organizations and committees) there should be devolution of management responsibilities to the local level (principle of subsidiarity). Where supported by appropriate legislation, such arrangements can improve the representativeness and accountability of the management system, thereby enhancing the likelihood of the local fishers seeing their needs and priorities being integrated into the decision-making process³⁵.

11.6 Recommendations related to fisheries co- management³⁶

The community-level organizations, working in partnership with other stakeholders and the government, could develop a resource management and community development plan, with objectives and strategies that include a co-management agreement. Community members should participate in the creation of the plan, validating its drafts along the way.

Reaching the co-management agreement may involve a series of meetings to negotiate and reach a consensus on its structure and to support management of conflicts. These meetings will involve identifying the key issues, as well as extensive bargaining and compromising in order to reach decisions.

The co-management agreement may include, specifically stated, a definition of roles, responsibilities and authority; identification of fora for meetings; conflict management mechanisms; and rule-making procedures. The agreement should be widely circulated to inform and obtain comments from relevant communities and stakeholders. A co-management body may be established at the end of the process of developing the agreement to represent all the partners.

³⁵ FAO. 2005. *Increasing the contribution of small-scale fisheries to poverty alleviation and food security*

³⁶ I. Rivera and Guieb, Rebecca: *Fishery Co-management: A Practical Handbook*. CAP International in association with the International Development Research Centre. 2006

The financial resources to implement the co-management plan should be identified early in the programme and made available before implementation. If external funding is needed to implement all or part of the plan, this is the time to identify a source and apply for the funds.

It should be noted that the strengthening of linkages and partnerships and networking between resource users, stakeholders, government and the external agent is an ongoing and continuous process that extends beyond the implementation phase. The roles and responsibilities of the partners will change and adjust as the community-based co-management programme matures.

Institutional support will be sought, for example, to have formal recognition of the community organization or passage of a government ordinance legitimizing local institutional arrangements (rights and rules).

11.7 Recommendations related to women empowerment in fisheries

Governments should introduce policies and programs that meet the needs of women in the fisheries sector, recognise and value the role they play and empower them at all decision-making levels — from the household to government.

Recommendations differentiated for different levels of women involvement in fisheries:

At the community level:

- Encourage the participation of women and women's groups in decision-making processes.
- Improve women's access to training and information on the fisheries sector so that they can participate from a position of knowledge.
- Enhance sensitivity to gender issues: i.e. lightening household responsibilities, such as by more equitable sharing of tasks with the spouse and children, or by providing community child care arrangements.
- Ensuring food security, developing marketing; i.e. providing policy support to women by improving their access to markets and storage of fish through provision of ice, will help improve the quality of the fish catch.
- Improve capability by supporting entrepreneurship; by facilitating access to fish resources and decision making women's organizations; and by training.
- Encourage income generating activities (alternative livelihoods) to provide incentive inputs and benefits for high and active participation of both women and men and to achieve sustainable fisheries resource management.

At Ministry / Department level:

- National policies on fisheries development should take the role of women into account. A specific policy on gender mainstreaming and strategy in the fisheries sector is a good way of taking this into account. This will require specific budget allocation.
- Fisheries departments should make the designation of gender focal points and form gender working groups. The coordination of the team should be done by senior position with influence.
- Maintain a contact list of national network members and those supportive of its activities (per country).
- Policy makers should be trained on gender issues.
- Government staff and extension officers should be trained to raise their awareness of gender issues and to improve their skills in gender analysis and at developing gender-sensitive projects.
- Increase the number of women officers in ministries and departments, especially those in decision-making posts.
- Collect information on research done to date on gender in fisheries; and promote further research that focuses on gender issues in fisheries.
- Put in place systems to monitor gender-related fishery issues and indicators that report the quality and quantity of gender information.
- Develop indicators that are specific to the achievement of gender equity and the empowerment of women in fisheries.

Governments should also put more attention in the gathering of information and how they develop research programs, specifically:

- Develop research and gender analysis methodologies;
- Collect data disaggregated by sex;
- Provide training to assist scientists and development specialists in research and program implementation;
- Develop sustainable institutional frameworks for gender mainstreaming;
- Sustain continuity in gender sensitive development research and strategic interventions;
- Increase gender sensitivity in research and policy design and management.

- Undertake research and analysis on:
- The conditions and contributions of women in small-scale and artisanal fisheries and fishing communities;
- The impact of development and conservation projects on the lives of men, women and children in fishing communities; and
- The impact of fisheries conservation and management measures on the lives and livelihoods of fishing communities.

11.8 Recommendations related to vulnerability to natural hazards

A strategy for disaster prevention, reduction and recovery should be established to help those identified as the most vulnerable in natural disaster “hotspots” to enhance their capacity for disaster prevention, emergency preparedness, response, and recovery.

Initial focus should be on laying the groundwork for strengthening national and regional capacities to reduce disaster risk, building a stronger case for disaster risk reduction as a core dimension of sustainable development, and putting in place the tools needed for intelligent planning and preparation. Priorities include expanding innovative partnerships and networks to meet critical needs; enhancing regional cooperation; standardizing and harmonizing risk management methodologies and practices; undertaking baseline studies to identify strengths and weaknesses of disaster reduction programs; and documenting best practices and lessons learned.

Fisherfolk are not only exposed to natural hazards but to severe day-to-day occupational risks which can curtail their income or personal ability to go to sea. Such risks are caused by adverse weather conditions, defective boats and poor safety equipment and practices, and increasing conflicts at sea including armed robbery. However, conventional insurance service plans are not designed to be responsive to these risks and they are not fisher folk friendly.

An insurance plan to protect fisher folk’s income and compensate for injury and property loss should be implemented.

11.9 Recommendations related to the protection of the environment

Introduction of good environmental practices

It is necessary to evaluate the environmental aspects of fisheries to determine both the impact of fisheries on the environment and the effect of environmental degeneration on the fishery sector.

Sustainable development and exploitation of fishing resources can only be guaranteed through deep scientific knowledge of the marine ecosystems and biodiversity of the Caribbean countries, social awareness and systematic environmental control and monitoring. Measures to evaluate environmental impact must be introduced and the principle of precaution must come into play.

Directives for improving good environmental practices must be introduced and rare species must be protected, their capture, as well as the commercialisation/marketing and ownership of products or sub-products, forbidden. Measures must be taken to avoid accidental capture; these include using selective equipment that excludes turtles, limited mesh sizes, confiscation of captures, establishment of closed seasons, prohibition of unloading small fry and the creation and suitable management of marine reserves.

In the long term, degraded areas may be considered for recovery and artificial reefs built to foster resource recovery.

Creation of Marine Protected Areas

Marine Protected Areas (fish sanctuaries, fishery reserves, no-take areas) have been strongly advocated as beneficial instruments for fisheries management.

If properly designed through a comprehensive scientific and participatory process, with due account taken of social and economic implications, protected areas (or reserves) might play a useful role, especially for coastal, small-scale fisheries that are multi-gear, multi-species and / or involve primarily sedentary stocks. Such protected areas can therefore contribute to long-run poverty alleviation through the improvement of the resource-base on which fishers and the rest of the community rely for their livelihoods e.g. through fishing, and/or local (eco)-tourism.

However, while protected areas have been shown (in the right conditions) to improve the long-term sustainability of the resource, in the short-term the creation of these protected areas may be at the expense of some marginalized or vulnerable groups who are denied access to the fishing grounds on which they used to rely to maintain their livelihoods, aggravating their difficulties, increasing costs and risks, including to their lives, as they are pushed to fish farther away from their homes. Assessing the distributional impacts of such measures, and considering the extent to which protected areas should allow poor fishers and/or certain types of small-scale gear to extract resources from them, should therefore remain one primary consideration in the creation of protected areas. Given that many such areas are often specified unilaterally by environmental ministries and departments, this requires fisheries departments to engage with other organizations so that such issues are fully assessed. Ultimately, there are no reasons why properly designed protected areas could not become fully integrated fishery management instruments.

11.10 Recommendations related to the aquaculture industry

Revitalization of aquaculture activities in the Caribbean is a priority because it can play a leading role in sustaining aquatic production, contribute to improving the living conditions of the population and generate foreign exchange for the country.

For proper aquaculture planning and management, the resources and opportunities they provide must be well understood. To do so, the most detailed information possible must be obtained to determine the target species, selection of cultivation techniques, categorisation of areas, identification of water or structural needs, conditions and opportunities for commercial exploitation, financial needs, etc.

For this reason, a study to determine the aquaculture potential of the different States must be made to provide conclusions that will support decisions on how to develop the sector in the various Departments in the country, both inland and on the coast.

Further, it must determine the most suitable area for each type of produce and select the most suitable species for each one, and, in each case, the environmental sustainability factors.

Some of the opportunities to be analysed are options for managing aquaculture integrated with irrigation, farming of continental species tanks at different scales and intensities and farming in tanks or enclosures in salt or sea water. The selection of species with the best market perspectives or highest commercial value, the use of foreign species for farming or the farming of non-food species are other aspects to be studied. Further, all the information compiled on past projects, the results of any actions previously carried out and the experiences of surrounding countries, minimise the risks of the actions to be taken and provide information for decision making.

Qualified personnel from each country should take part when studying the potential of aquaculture, thus ensuring the information compiled is suitable and the actions proposed the most appropriate. This will also permit future lines of investigation in aquaculture that may use the experiences and resources of regional research bodies for support and provide a response to specific problems especially in the areas of species biology, preparation of feed, intensification processes, environmental aspects, etc. This study should also serve to improve the training of personnel taking part; it could therefore be completed with technical and management training sessions.

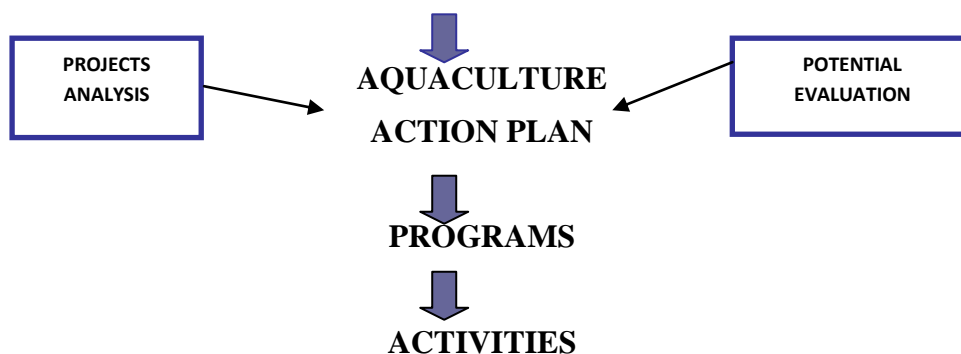
It would be extremely useful to have a tool to store and exploit the basic data of the aquaculture sector and that could contribute to decision-making in the planning and management authorities. An information system could be designed and implemented, to include basic data on the sector such as the number of facilities / units of cultivation, active or inactive condition, geographical location, water use, cropping patterns, crop species and their production, human resources involved, availability of agricultural products for inputs, closest rural and urban center of population, markets, etc. This system may take the form of Geographic Information System (GIS) and will integrate as much information available from studies and actions of the different national or international organizations that have participated in each country.

Furthermore, the establishment of a network will contribute to improvements in the planning of the activity and the effective exchange of information between different agents. This network will have among its activities the rapid and effective dissemination of information generated in different projects in the country, collecting literature and technical documentation, standardization of terminology, participation in the activities promoted in the field of aquaculture, organizing various activities for the dissemination of aquaculture activities (seminars, workshops, promotional campaigns, ...) and participation in different forums particularly in regional aquaculture.

All information collected should be used for the preparation of Action Plans (national and regional) for the development of aquaculture, which should provide confidence to invest, and manage national and international efforts for the development of commercial aquaculture in CARICOM. These plans should include programs and activities to be implemented in the short, medium and long terms within the different areas: adequacy of human capacity through

technical training and management, construction or improvement of facilities and infrastructure, availability of materials and infrastructure for cultivation, application of technologies, implementation of legal and administrative actions to promote private investment, schedule and budget of every performance, etc..

NATIONAL STRATEGY FOR DEVELOPMENT FOR FISHERIES AND AQUACULTURE SECTORS



In order to enhance the productive capacity, it is a priority to implement the actions for the optimization of production processes and to improve the control and integration of technologies. These should include projects to improve the production conditions of the growth units which are in operation, by improving the management of infrastructure, the acquisition of fishing equipment, building structures for fish manipulation and storage, etc. They should also assess the technological needs of energy supply and for cultivation among others. Such actions should improve acquisition, operation and maintenance.

On the other hand, a pilot culture project on a commercial scale could be launched, taking into account the results of small-scale projects that are being developed to propose the location and cultural practices which are more appropriate to the situation of each country.

Public support must be one of the major drivers of private investment. National institutions and international organisations must provide the minimum initial conditions required for developing aquaculture through detailed planning and suitable management. It will therefore be necessary to assign competencies to the various bodies involved and to design the strategy to follow. This strategy should include all key aspects for developing aquaculture: updated regulatory framework, adaptation of human capacities, foster private investment and suitable management of environmental implications, including the compatibility of the activity with other uses of land and water. Further, it will be necessary to focus aquaculture information campaigns on rural farmers and potential investors.

With regards to small-scale aquaculture, public support should be directed at creating access to the minimum capital required for acquiring materials and intermediate goods. Technical assistance and access to finance must drive these small investments ensuring that activities are profitable and have suitable running costs. Also, the women should be encouraged to participate in this activity, thus improving conditions in rural communities. Associations of producers to guarantee sufficient, permanent offer at steady prices will allow small-scale commercialisation and ensure sustainability. The strengthening of the fish product market, including aquaculture produce, through conservation and product processing capacity and infrastructure and transport improvement will allow entry of fish products into the commercial network.

Regarding industrial scale aquaculture, public support should be channelled towards businesspersons through fiscal or other incentives. Starting up farms with the minimum commercial dimension should initially allow the import of feed and, in the longer term, development of a home industry for manufacturing it. Further, high production volumes will allow exports to Europe and the USA if the suitable health and sanitary standards can be met. Awareness campaigns on aquaculture business opportunities could motivate national or foreign investors to finance small or medium sized businesses.

To begin aquaculture activity, personnel with a minimum specialised technical and management knowledge in the activity are required. Training in managing and planning the activity should be addressed to those responsible in the administration.

The following obstacles to a rapid development of aquaculture have been detected: lack of manpower experienced in aquaculture, shortage of land suitable for pond construction, shortage of fresh water in the smaller Caribbean islands, high rates of evaporation, lack of information on availability of ingredients for fish feeds, inadequacy of legal framework for development of aquaculture, and occurrence of tropical storms. For mariculture the low tidal range presents an additional constraint, as do the often low levels of nutrients in coastal waters.

V. ALTERNATIVE LIVELIHOODS

The need for sustainable livelihoods for fishing communities is critical. Population growth rate continues to increase, while marine resource stocks continue to dwindle. Even where suitable fisheries management systems are in place, there are simply too many people fishing too few fish. Alternative livelihoods are seen as essential for both the development of fishing communities and for the conservation of marine and coastal biodiversity and ecosystems.

The concept of ‘alternative livelihoods’ has emerged where natural resources, such as the coast, have come under increasing pressure and current use patterns are no longer considered to be sustainable. Definitions of alternative livelihoods (also known as alternative income generating activities or AIGs) vary within the literature. One definition of the term describes it as:

- allowing or necessitating a choice between two or more livelihood activities.

Another is:

- livelihoods that exist outside of the traditional or established activities for a given area.

But neither of these definitions touches on the issue of sustainability and alternative livelihoods defined this way will not necessarily bring about the changes we want to see.

As Johnson and Start (2004) argue, livelihood diversification is about more than multiple income sources i.e. alternatives, it relates also to the transformation of economies and the complex nature in which people make decisions within those economies. The introduction of alternatives alone will therefore not necessarily bring about the change that is desired or expected.



Photo 11. Fishing boat. Jamaica
Source: Authors

Specifically, livelihoods are defined as the way people combine their capabilities, skills and knowledge with the assets at their disposal to create activities that will enable them to make a living³⁷.

The idea driving alternative livelihoods is that they create an incentive for people to stop their current unsustainable livelihood activities and move into another activity which is sustainable. For this to work the alternative needs to be more economically profitable. However, profitability is not the only factor. Attitudes to risk, access to assets, vulnerability and institutional influences all influence the way people make decisions. As a result, the concept of alternatives becomes much more complex.

The goal of alternative livelihoods is not simply to come up with an alternative activity that theoretically provides choice and hopefully promotes sustainability as much of the current work in this area seems to do. Rather the goal is to find solutions that fit with people's current livelihood strategies and that will have positive impact on their livelihoods and the use of natural resources.

There is also growing recognition in the literature that outside support has all too frequently tried to move people into completely new livelihood activities whilst leaving their old livelihood activities behind. This is a risky strategy and as the literature points to the fact that the poor, because of their circumstances are often risk averse, it is also a strategy that is unlikely to result in the desired change.

IMM (IMM Ltd, 2008) proposes that there are three broad approaches to improving livelihood security and sustainable use of natural resources on the coast. These are the enhancement, diversification and development of alternative livelihood strategies.

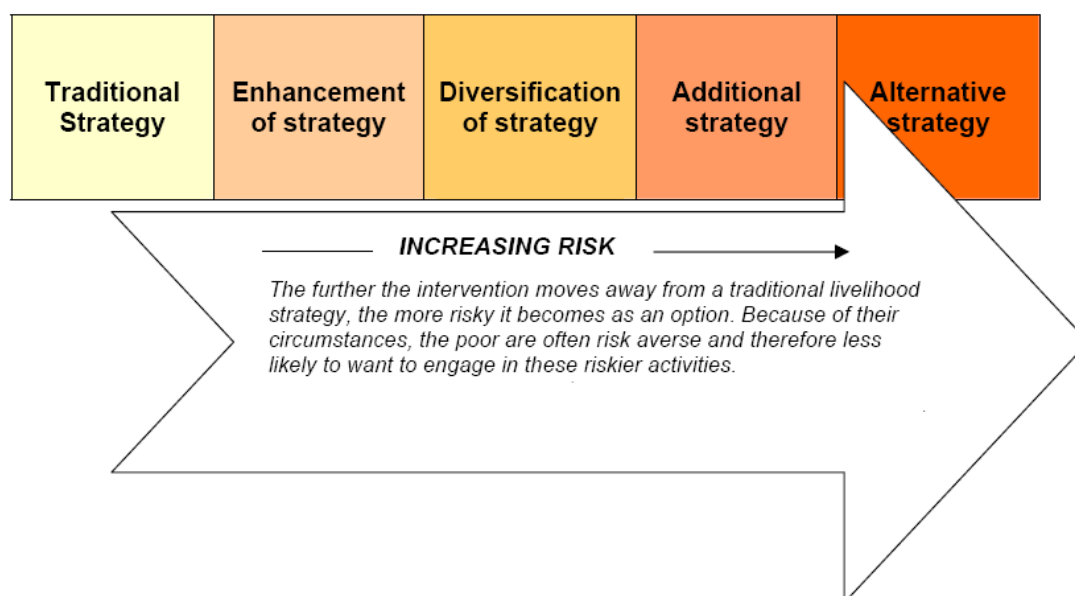


Figure 64. Options for changing livelihoods
Source: Ireland, C. 2004 (adapted from IMM's approaches to livelihood security)

³⁷ Ireland, C. 2004

12. Income generating activities

Over 100 different coastal livelihood income generating activities were identified. Some of these are traditional practices others are new activities that have been introduced. The aim is not to replicate this long list of activities here, but in order to set the scene for the analysis in the next section on the perceived need and demand for alternative livelihood opportunities, it has been presented as a selection of these coastal livelihood activities below.

Environment and Natural Resource (ENR) Based Livelihood Activities	Non – ENR Based Livelihood Activities
Agriculture (crop and livestock) Aquaculture (all types) Bed making Bee keeping Boat building/repair Carpentry Charcoal making Coconut collection and selling Cooking and selling food Cosmetic: soaps, creams, shampoos, etc Cow dung collection Cut flowers Crab fattening Employment (food processing factories) Fish processing Fish trading Fishing (all types & all gears) Fuelwood collection Gum collection Handy craft (mat making, bags, baskets etc.) Harvesting and selling coconut by-products Hunting Lime making Mangrove harvesting (inc. selling poles) Monitoring and control of marine reserves Mariculture (all types) Palm wine making Poultry farming Post larvae collection Shrimp nursery Salt Panning Seaweed collection and farming Shell collection Stone quarrying Thatch makers & collectors Tourism and touristic activities (e.g. whale watching) Traditional medicine Waste recycling Weaving using natural fibres	Bicycle repairers Black smiths Builders Dress making Employment (local government) Employment (private sector) Guest houses Hair dressing Ice sellers Labouring Mechanics Net making/repair Petty trading Pottery Renting of diving material Seasonal migration to towns Small shop items sold at side of road Shop keepers Transport (on bicycles) Textile factories

Table 104. Environment and natural resources based and not based in livelihoods
Source: Ireland, C. 2004 and Tragsattec

This list is a selection from those reported in the literature and is not intended to be an exhaustive list, nor has the list attempted to separate sustainable and non sustainable activities. The purpose of the table above is to demonstrate the wide diversity of livelihood strategies currently being employed along the coast worldwide.

Figure 65 shows how this diversity exists even within a community.

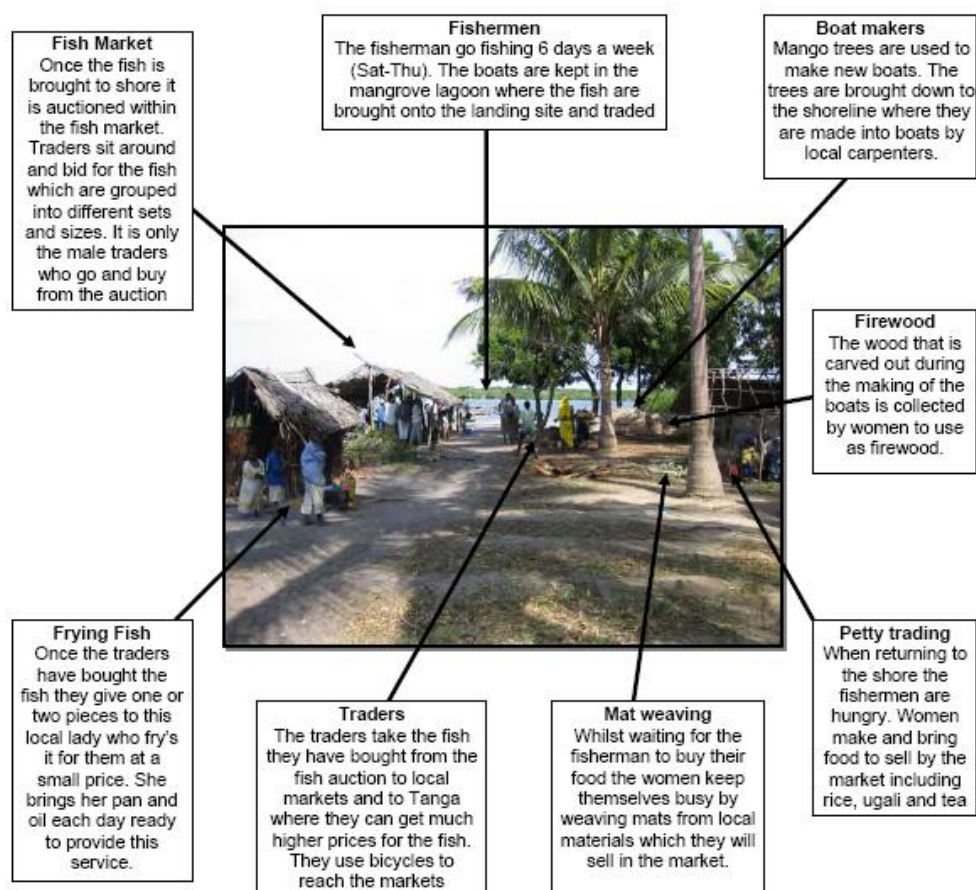


Figure 65. Diversity of livelihood strategies at Mwandusi Fish Market in Tanga, Tanzania
Source: Ireland, C. 2004

13. Fisheries Livelihoods Assessment

From the literature we can see that experience on introducing 'alternative livelihoods' has shown it to be a complex subject. Simply identifying a new livelihood opportunity from the growing global list of ideas that are emerging and introducing it into a community without taking into account wider livelihood issues and influences is unlikely to bring about the desired change you want to see. The sheer number of failures that exist in the literature is evidence to this.

Alternative livelihoods are not a short cut to quick development and conservation wins. Rather it is an intervention that requires a thorough understanding of the livelihoods of the community.



Photo 12: Fishermen Grenada.
Source: Stuart Shafran and Tob Gobber

Interventions to support livelihoods should take place over a spectrum and be relevant to people's needs and aspirations.

Certain ingredients are key to the success of an alternative livelihood activity. These are:

- The need for a clear vision by both the community and the supporting agency as to what the expected outcome is. Where this joint vision has not existed failure of the alternative livelihood projects has been high.
- All stakeholders should participate in the identification and design of the intervention.
- Skills and knowledge have to be established and developed (technical and management skills as well as an understanding of the wider context in which the activity is developed) through making training opportunities available over the longer term.
- Technical guidance is necessary over the long term rather than only at the start of an activity.
- An activity will be taken up and made successful if the people who are to carry it out have chosen to carry it out, even if the activity was introduced or initially supported by external sources. Often people will find solutions to their constraints (except external shocks and trends). An activity has more chance of success as an alternative activity if it is identified by the communities themselves. The role of the project or institutions is then to make choices available to ensure its effective implementation.
- An activity will be carried out if it brings equal or superior economic returns to a previous activity of the individuals involved, or it brings supplementary income. Cultural compatibility is paramount.
- Access to micro-credit is essential. Most alternative income generating activities (AIGs) are generally small enterprises of some sort and these tend to require an initial capital investment or start up cost. Without access to micro-credit people are generally reluctant to take forward an AIG.
- Understanding the market and accessing the market targeted by the activity developed is core to the financial sustainability of an AIG. Failure to look at the issue of access to markets and market demand before embarking on an alternative livelihood could lead to the failure of the intervention (e.g. the introduction of pottery activities when there is a lack of market demand).
- If the development of AIGs is promoted to reduce pressure on resources, the pressure on this resource needs to be clearly understood in the first instance. If the challenges which are causing this pressure in the first instance are not addressed then the AIG is unlikely to reduce any further pressure.
- Favourable policies will increase the success of an activity.

- Infrastructure will affect the success and rate of development of an activity.
- Using business models and approaches to plan and take forward the alternative livelihood activity.
- Understanding people's attitude to risk is key when supporting livelihood initiatives.
- It is important to understand that community groups are not homogeneous. Opportunities may be easily taken by some individuals and not by others. When developing AIGs, this heterogeneity has to be taken into consideration and, depending on the objective of the intervention; actions must be taken to ensure access by all individuals within the intervention target group.

14. Proposal for Livelihoods Assessment

The objective of the fishing livelihoods assessment is to demonstrate the feasibility of building up a more comprehensive understanding of fishing livelihoods and the context in which fishing communities are currently surviving in order to identify appropriate entry points for supporting the achievement of sustainable livelihoods.

The proposed framework (should be adapted to the local context in which it is being applied) is as follows:

Some of the phases have been already carried out to the effects of this study. The rest were performed during the workshop

Fisheries Livelihoods Assessment makes visible:

- the different needs, priorities, capacities, experiences, interests, and views of men and women;
- who has access to and/or control of resources, opportunities and power;
- who does what, why, and when;
- who is likely to benefit and/or lose from new initiatives;
- gender differences in social relations;

14.1 Phase 1: Identify fishing community and contacts within the community

For each selected country in the study the following communities were identified:

- **Bahamas:** Abaco, Acklins Island, Central Andros, Crooked Island, Eleuthera, Grand Bahama, Long Island, Mayaguana, North Andros, South Andros.
- **Barbados:** Christ Church, Saint George, Saint James, Saint John, Saint Joseph, Saint Lucy, Saint Michael, Saint Peter, Saint Philip, Saint Thomas.

- **Belize:** Belize, Cayo, Corozal, Orange Walk, Stann Creek, Toledo
- **Grenada:** Carriacou, Petite Martinique, St. John's, St. Andrew's, St. David's, St. George's, St. Mark's, St. Patrick's.
- **Guyana:** Region # 2, Region # 3, Region # 4, Region # 5, Region # 6,
- **Jamaica:** Clarendon, Hanover, Kingston, Manchester, Portland, Saint Andrew, Saint Ann, Saint Catherine, Saint Elizabeth, Saint James, Saint Mary, Saint Thomas, Trelawny, Westmoreland.
- **Montserrat:** Bunkum Bay, Carr's/Little Bay, Ilse Bay.
- **Saint Kitts and Nevis:** St. Mary/St. John, St. Anne's, St. George, St. James, St. Paul's, St. Peter's, St. Thomas/Trinity.
- **Saint Vincent and the Grenadines:** Barrouallie, Bequia, Buccament, Calliaqua, Camden Park, Canouan, Chateaubelair, Clare Valley, Fancy, Fitz Hughes, Great Head Bay, Indian Bay, Kingstown, Layou, Lowmans, Mayreau, Owia, Petit Bordel, Questelles, Sandy Bay, Union Island.
- **Trinidad and Tobago:** Caroni, Mayaro, Nariva, St. Andrew, St. David/North East, St. Andrews / South West, St. David, South West, St. George, St. George/East, St. John / East, St. Mary / North East, St. Mary / East, St. Patrick, St. Patrick / South West, St. Paul / East, Victoria.

It is recommended that the livelihood assessments be started in those communities which have been considered as the poorest ones, such as Region 3-West Demerara (Guyana), Kingston (Jamaica) and Toledo (Belize).

14.2 Phase 2: Collect secondary data on the environment, previous socio-economic and household studies and other research/literature to build up a background to the area. Emerging macro-economic issues identified from literature

In addition to the literature review, household interviews can be considered as an effective method to collect data. Household interviews are a method of making detailed examination of the way that a household thrives and survives. The analysis helps communities and researchers to have a better understanding of how they cope and why they make certain decisions: how they spend money and what their priorities are. It also helps people to think about their sources of income versus expenditure, and to look for opportunities and plan ways to solve their problems.

In the case of this Study, the household interview (see Appendix III to check the questionnaire) was carried out from May 2010 to June 2011 by fisheries officers of the ten selected countries.

CHARACTERISTICS OF A GOOD SURVEYOR

A good surveyor must have the following characteristics:

- ☐ Be prepared to inspire trust and assurance to people
- ☐ Have a special character which helps him/her to remain unflappable in unexpected situations such as: excess of procedures¹, direct or indirect claims, abrupt or violent rejection, threats or others
- Possess good public relations skills in order to always relate with the interviewee in a cordial manner
- Feel highly self-confident, capable of taking immediate decisions in the field, with a broad understanding and mastery of all conceptual aspects that their activities involve

NOTE: For further information about interview technique please check section 4.5 of the Field Manual prepared by the consultant to collect the questionnaires information

14.3 Phase 3: Undertake a stakeholder analysis to build up an understanding of who is involved with, has an influence over or has an interest in the identified coastal community. Through using a selection of analytical tools build an understanding of the different assets, skills, capacities, needs and aspirations of the community. Identify vulnerabilities and external influences (policies, institutions, organisations and processes) that affect the community

As a first step, a comprehensive picture of the stakeholders (interest groups, institutions, individuals, etc.) affected by the project/problem context is developed. Any individuals, groups of people, institutions or firms that may have a relationship with the project are defined as stakeholders. In order to maximize the social and institutional benefits of the project and minimise its negative impacts, stakeholder analysis identifies all who are likely to be affected (either positively or negatively), and how. To gain information, interviews and discussion techniques are commonly used

Stakeholder and basic characteristics	Interests and how affected by the problem(s)	Capacity and motivation to bring about change	Possible actions to address stakeholder interests
Fishing families: c.20,000 families, low income earners, small scale family businesses, organised into informal cooperatives, women actively involved in fish processing and marketing	<ul style="list-style-type: none"> • Maintain and improve their means of livelihood • Pollution is affecting volume and quality of catch • Family health is suffering, particularly children and mothers 	<ul style="list-style-type: none"> • Keen interest in pollution control measures • Limited political influence given weak organizational structure 	<ul style="list-style-type: none"> • Support capacity to organize and lobby • Implement industry pollution control measures • Identify/develop alternative income sources for women and men

Table 105. Example of stakeholder analysis
Source: EuropeAid Cooperation Office

► **The Activity Analysis**

The first step in a stakeholder analysis is to identify the activities performed by men and women in society; to find out who does what, how and when.

The Activity Analysis is a gender-based analytical tool capable of identifying the activities performed by men and women in their daily lives. It is based on the sexual division of labour and takes into account the frequency of the activity and the amount of time devoted to it.

Activity analysis explores who does what type of work, distinguishing between productive, household and community roles:

- **productive work** produces goods and services for home consumption and sale. This includes employment and self-employment in both the formal and informal sectors. Both women and men can be involved in productive work but their professions, activities and responsibilities often vary according to the gender division of labour.
- **reproductive work** involves the care and maintenance of the household and its members. Women tend to be most active in reproductive work, such as preparing food, collecting water and fuel, bearing and caring for children, caring for other household members and maintaining the house. Men may be responsible for constructing the home, household security and decision-making.
- **community work** involves the activities for the management and wellbeing of the community that are voluntary and unpaid.

Below, in Table 106 is an example of an activity Profile completed in a fishing community which can be used as a guide.

Activity profile			
Household tasks	Who does the work?		Frequency and time of activity
	women	men	
Cleaning	x		Daily: From 6 am -8 am
Preparing lunch/breakfast	x		Daily: From 6 am -8 am
Washing clothes	x		Daily: From 6 am -8 am
Take care of children	x		Daily: From 9 am -12 am
Bring children to school	x	x	Daily: From 6 am -8 am. Men only if transport is necessary
Collecting water	x	x	Daily 7-8 am depends
Shopping, food, clothes	x		Daily
House construction and maintenance		x	When required
Production of goods and services	Who does the work?		Frequency and time of activity
	women	men	
Collect fish/shrimps	x	x	Daily: Men from 5 pm -6 am, women 6 pm - 4 am
Fix gear	x	x	Daily: men 12 am- 4 pm, women from 9 am -12 am,
Selling fish in the market	x		Daily: Women from 6 am -7 am
Salting fish	x		Few times a week
Extracting titanium		x	Occasionally
Community Tasks	Who does the work?		Frequency and time of activity
	women	men	
Funeral preparation	x	x	Occasionally
Wedding preparation	x	x	Occasionally
Fishing day	x	x	Once a year
Community day	x	x	Once a year
Local community meetings	x	x	3 times a year
Fishing associations meetings		x	Regularly: each 2 days

Table 106. Activity profile.
Source: Authors

Another technique to collect information about the gender division of labour and how time is used is by using the Daily Routine Profile (see example below: Table 107). It is important to remember that routines may change with the seasons.

HOURS	ACTIVITIES	
	women	men
5 - 7	Cleaning and washing Cooking breakfast Laundry Feed the animals (pigs, chickens, ducks) Prepare children to go to school Prepare food for husband to go fishing	Preparing food for the animals Feed the animals Cleaning the cages Preparing fishing gears
7 - 9	Work in the rice field Go fishing (2- 3 times/ week)	Sell fishing products to middleman Help women on the rice field or go fishing
9 - 11	Work in the rice field Cooking lunch & lunch break Feed the animals	Help women on the rice field or go fishing
11 - 13	Work in the rice field Go fishing (2- 3 times/ week)	Lunch break and rest
13 - 15	Sell fishing products to middleman Go to the market for food, clothes, etc	Rest
15 - 17	Bath the children Cooking dinner Feed the kids Prepare lunch for husband to go fishing	Rest (until 16.00 – 16.30) Prepare fishing gears
17 - 19	Prepare beds Socializing	Go fishing
19 - 21	Socializing	Fishing
21 - 24	Rest	Fishing
24 - 2	Rest	Collect fishing gear and return home
2 - 5	Rest	Rest

Table 107. Daily routine profile
Source: Authors

With these techniques we can determine the time and use of family and outside labour and show critical periods of work and roles. This can also be used to demonstrate seasonal restrictions and opportunities.

► Access to and control over resources and benefits

Productive as well as reproductive and community work requires the use of resources. The Framework for Access to and Control over Resources and Benefits explicitly maps the real access that men and women have to the resources and benefits.



Resources can include:

- **Economic:** these encompass both productive resources, such as land, equipment, capital and other assets, cash, work and financing;
- **Social:** include mutual aid social networks, kinship networks, networks for organising reproductive work, etc.
- **Political:** resources here include political power, representative organisations and associations, local leadership, opportunities for communication, negotiation and consensus, assessments regarding social standing, status and credibility.
- **Time:** the availability and control over one's own time, whether hours of the day or periods of the year available for discretionary use (leisure, learning, time for oneself, etc.), is a key resource for development.

- **Mobility:** mobility, as a resource, requires us to weigh up the extent to which physical movement is restricted by norms and customs, as well as the constraints on accessing certain forms of transport or locations.
- **Information / education:** these include resources and benefits such as education, or the opportunity to exchange opinions and information.
- **Personal:** these include, but are not limited to, self-esteem, self-confidence and the capacity to express one's own interests and opinions in private and in public.



Benefits can include:

Satisfaction of basic needs, such as food, clothing and shelter; cash and financial income; the possibility of owning property and of receiving an education and training; political power, prestige, and status; and opportunities for pursuing new interests.

This list is non-exhaustive and can be expanded with other kinds of resources relevant to each specific case. Likewise, there is no need to make express reference to each type of resource or benefit if it is deemed irrelevant.

- Some of the questions guiding this exercise are as follows:
- Who is able to use the resource?
- Who is able to make decisions regarding the use thereof?
- Who is entitled to sell or freely dispose of it?

The Access to and Control of Resources and Benefits Profile can be used to map the real access that men and women have to the resources and benefits. Below, in Table 108 is an example of the Access to and Control of Resources and Benefits tool.

Access and Control of Resources					
Resources	Who has access?		Who has control?		
	women	men	women	men	other
Mangrove forest	x	x	x	x	
Fishing resources	x	x	x	x	
House	House owner	House owner	House owner	House owner	
Rice fields	x	x	x	x	
Household farm	x	x	x	x	
Boat	boat owner	boat owner	boat owner	boat owner	
Community fishing grounds	x	x		x	
Fishing gears		x		x	
Tractor		x		x	
Bicycle and motorbike	x	x	x	x	
Tuk tuck		x		x	
Clean water					
Electricity					
Toilets					
Firewood	x	x	x	x	

Primary education	Limited	x			
Secondary education					
Processing storage in the village	x	x	x		
Access to credit	x	x	x	x	
Hospital or health services					
Time	x	x	x	x	
Self-confidence	x	x	x	x	
Access and Control of Benefits					
Benefits	Who has access		Who has control?		
	women	men	women	men	other
Fish for household use	x	x	x	x	
Meat and eggs for household use	x	x	x	x	
Income from fish sales	x	x	x		
Income from animals sales	x	x	x		
Knowledge from training	limited	x	x		
Labour	x	x	x	x	
Leisure time	x	x	x	x	

Table 108. Access and Control of Resources and Benefits

Source: Authors

The way resources are perceived and used has a great deal to do with gender, age, social class and culture. Efforts are therefore needed to ensure these interrelations are taken into account with regards to a given society and context.

► Gender Needs

Women and men may well have different needs and interests, arising from the obligations, responsibilities and activities assigned to them in a given society, and also from unequal access to, and control over resources and benefits. These are essentially the gender needs.

Gender needs are actually identified by the people involved in the interventions, either through discussion groups, or other participatory approaches enabling women to express their own interests. Below, in Table 109 is an example of a Gender Needs Framework completed in a fishing community.

Gender Needs			
Practical		Strategic	
Women	Men	Women	Men
<ul style="list-style-type: none"> ▪ Loans for their career ▪ Purchase net and more fishery equipment ▪ Want to know how to read and write ▪ Need fingerlings of fish and shrimp for fish & shrimp farming after re-arrangement of lagoon area. ▪ Changing career from natural fish catching to fish and shrimp farming (local authority will withdraw their lagoon area and they will have no lagoon plot anymore to produce natural fish and shrimp) ▪ Job opportunities: they want to be hired as a labourer by companies or factories. 	<ul style="list-style-type: none"> ▪ Training on changing new careers, because local authority will withdraw their lagoon plot; they need more new techniques and knowledge of new careers. ▪ More support on fuel for fishing boats to catch fish from the sea. 	<ul style="list-style-type: none"> ▪ Enhanced political participation and leadership ▪ Access to primary education: they want to know how to read and write ▪ Access to credit loan schemes by local banks. 	<ul style="list-style-type: none"> ▪ Access to loans from credit schemes to upgrade their houses, re-build their nets and buy new fishing equipment. Some of fishers working on the sea are looking forward to bigger credit schemes to upgrade their fishing boats. ▪ Support from local authority on household economic and social benefits for their children.

Table 109. Gender needs

WHY SO STRONG GENDER COMPONENT?

All the tools have a strong gender component; this is due to the evident differences in daily activities, access and control of resources and even in aspirations and needs between men and women. At the time of introducing a new livelihood alternative in a community it is necessary to take these differences into account.

14.4 STEP-BY-STEP Guide to carry out the Phase 3 in a Fishing Community

This section describes a field theoretical work session to carry out the Phase 3.

INTRODUCTION

Given that during the process the team will deal with persons that they do not know, it is necessary to gain the trust of these persons to obtain the information, fluently and accurately. This will be achieved if, to start, S/he presents her/himself suitably and provide information about the objective of the activity.

Estimated Time: 15 minutes

STEPS

- 1º) Welcome everybody and thank them for their time
- 2º) Introduce yourself and the team
- 3º) Present the project

- 4º) Present the activity
- 5º) Explain that the aim of the visit is to conduct a livelihood assessment
- 6º) Explain what a livelihood assessment is
- 7º) Highlight the importance of conducting a livelihood assessment
- 8º) Explain that, in order to conduct a livelihood assessment in their community you need to collect info through using defined tools
- 9º) Ask for the active participation of everyone
- 10º) Start

FIRST SESSION: Activity profile

Estimated Time: 3 - 4 hours

STEPS

- 1º) Explain the concepts of productive/reproductive/community work and give examples
- 2º) Divide participants into two groups (men group and women group)
- 3º) Distribute the table of Daily Routine Diagram (24 hours) to each group.
- 4º) Explain how to fill in the table and ask them to list all activities they can think of even those that sounds not important to them.
- 5º) Facilitators pick up the results of the groups and fill in the table of Activity Profile based on the table of Daily Routine Diagram.
- 6º) Discuss in plenary the results
 - Check if the results collected in both groups about the daily routine activity coincide
 - Identify those activities performed by men and women that are out of the daily routine (e.g. attending village meetings)

SECOND SESSION: Access and control

Estimated Time: 4 hours

STEPS

- 1º) Explain the concepts of “resource” and “benefits”

- 2°) Talk about the different types of resources
- 3°) Give examples
- 4°) Ask participants to list all kinds of resources and benefits they can think of in their commune
- 5°) Encourage participants to identify the differences of “access” and “control”
- 6°) Provide further explanation about what “access” means and what “control” means
- 7°) Divide participants into two groups (men group and women group)
- 8°) Distribute the table of Access and Control Profile to each group.
- 9°) Explain how to fill in the table and then ask each group to think which resources do women have access to and which resources do men have access to. Which resources do women have control over and which resources do men have control over
- 10°) Discuss the results in plenary
 - Identify difficulties for women to access to resources
 - assess the gap of decision making power between men and women over the resources

THIRD SESSION: Gender problems and needs

Estimated Time: 4 hours

STEPS

- 1°) Encourage participants to identify problems in their community (if you notice they are reluctant to speak, then form groups and give them some cards to write down the problems)
- 2°) Discuss each problem with the questions: How does the problem affect men? How does the problem affect women?
- 3°) Discuss the cause-effect relationship
- 4°) Explain the concepts of “practical” and “strategic” needs
- 5°) Give examples
- 6°) Divide participants into two groups (men group and women group)
- 7°) Distribute the table of Gender Needs Analysis to each group.

- 8°) Ask each group to identify the gender needs corresponding to the problems identified
- 9°) Based on group results, give comments as necessary

Another interesting activity is to identify the aspirations of women and men as they relate to real possibilities for improving their lives and the conditions within their communities by asking open questions to stimulate a discussion. An example could be, “What would you like to do to improve your life?” or “What is your dream for your community?”

IN ORDER TO USE THE TOOLS:

- direct contact is required with the beneficiary community or group of the intervention;
- ensure that all individuals tagged as key for the intervention have been duly interviewed, or have otherwise played a direct role in securing the information or in utilising the analytical tools;
- we recommend conducting the consultation process with both single-sex groups (both men and women) and mixed groups;
- it is important to involve a sufficient number of people to mirror the considerable variety of socio-economic situations and identities that exist within a given community.

14.5 Phase 4: Alternative Analysis

Once the required information has been collected, the analysis of the best livelihood alternatives for the community should be carried out. The ones selected should be put in writing in order to materialize them as a project (project design).

14.6 Phase 5: Project design

The project design should include, but not be limited to, the following information:

- Name
- Background and Rationale
- Objectives
- Definition of activities and outputs
- Definition of inputs
- Identification of stakeholders, beneficiaries and benefits

- Risk analysis and assumptions
- Timetable for implementation
- Estimated Budget

14.7 Phase 6: Project implementation and monitoring

To implement a fisheries livelihood project is necessary to have a monitoring plan in place that is feasible and effective.

Monitoring can be defined as the systematic and continuous collecting, analysing and using of information for the purpose of management control and decision-making. Monitoring considers the question ‘Are we doing the project correctly?’ Its purpose is to alert management to any problems that arise during implementation.

The implementers and planners have to agree on monitoring indicators. Monitoring indicators are quantitative and qualitative signs (criteria) for measuring or assessing the achievement of project activities and objectives. The indicators will show the extent to which the objectives of every activity have been achieved. Monitoring indicators should be explicit, pertinent and objectively verifiable.

Monitoring Indicators are of four types, namely:

- Input indicators: describe what goes on in the project (e.g. number of bricks brought on site and amount of money spent);
 - Output indicators: describe the project activity (e.g. number of classrooms built);
 - Outcome indicators: describe the product of the activity (e.g. number of pupils attending the school); and
 - Impact indicators: measure change in conditions of the community (e.g. reduced illiteracy in the community).
- The results of the Household surveys provide extensive background information that can be used as indicators to monitor alternative livelihood initiatives in the ten selected countries of the study. For instance:
- Percentage of poor / vulnerable and non poor households
 - Home income
 - Percentage of households that manage to make ends meet
 - Percentage of households engaged in the activity
 - Others...

Below, in Table 110, is a proposal to monitor progress by using indicators

Indicator	Value before intervention	Expected value after intervention	Real Value after intervention	Degree of achievement

Table 110. Values of indicators
Source: Authors

APPENDIX I: Countries Profile

Main Findings of the Diagnostic Study to Determine the Levels of Poverty in Fishing Communities in Selected CARICOM Countries:

THE BAHAMAS

Key facts³⁸

Population 2011 *	313,312
Net primary enrolment **	91%
Direct and indirect jobs in fisheries sector	8,800
GDP Total 2009**	US\$7.2bn
Services **	80%
GDP by Sector Industry **	18%
Agriculture **	2%
Fisheries sector ***	1%

The sample studied

Household surveys were conducted in the islands with the highest fishery activity, most significantly in Abaco, North Andros and Grand Bahama.

Chart 1 shows the number of surveys conducted in each district studied. In this country aquaculture is negligible. Processing industry surveys were concentrated in Abaco, Grand Bahama and Eleuthera.

Districts sampled	Aquaculture	Fishermen	Processing	Total
North Andros	-	29	-	29
Central Andros	-	5	-	5
South Andros	-	5	-	5
Long Island	-	5	-	5
Crooked Island	-	6	-	6
Acklins Island	-	7	-	7
Mayaguana	-	6	-	6
Abaco	-	26	1	27
Grand Bahama	-	10	2	12
Eleuthera	-	5	2	7
Total general	-	104	5	109

Chart 1 Completed questionnaires by type and sample district in Bahamas

Main Findings of the Study

The extent of poverty in households of the Bahamian fisheries sector.

In the data analysis no poor households were detected, however **5.61% of vulnerable households** were observed in **Central Andros, Abaco and North Andros** (Chart 2). All households surveyed in the remaining regions met all basic needs.

Bahamas' surveyed districts	Non-poor	Vulnerable	Poor	% Responses per Region
Long Island	4.67%	0%	0%	4.67%
South Andros	4.67%	0%	0%	4.67%
Crooked Island	5.61%	0%	0%	5.61%
Mayaguana	5.61%	0%	0%	5.61%
Acklins Island	6.54%	0%	0%	6.54%
Eleuthera	6.54%	0%	0%	6.54%
Grand Bahama	11.21%	0%	0%	11.21%
Central Andros	3.74%	0.93%	0%	4.67%
Abaco	23.36%	0.93%	0%	24.30%
North Andros	22.43%	3.74%	0%	26.17%
BAHAMAS	94.39%	5.61%	0%	100%

Chart 2 Extent of poverty in households of the Bahamian fisheries sector.

All vulnerable households belonged to the **extractive fishing sector** and their main constraints are linked to **access to services, economic capacity and education**. (Chart 3)

³⁸ * CIA Factbook; ** 2011 Commonwealth Yearbook; *** National fisheries officers 2010

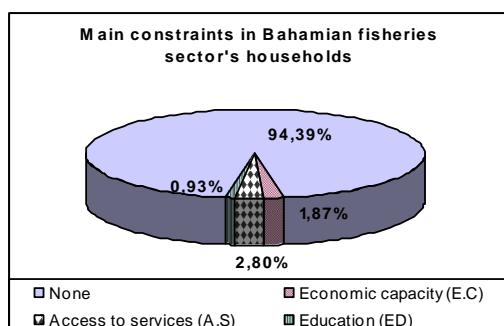


Chart 3 Main constraints in households of the Bahamian fisheries sector

Chart 4 disaggregates by district the vulnerabilities detected in the data analysis. **Special attention should be paid to these regions and their needs.**

Region	Constraints	Condition of household	Sector
North Andros	Access to services	vulnerable	extractive fishing
	Economic capacity		
Abaco	Education	vulnerable	extractive fishing
Central Andros	Economic capacity	vulnerable	extractive fishing

Chart 4 Main constraints by region. The Bahamas

Living conditions and access to services

In general, Bahamian dwellings are **undivided private houses built with solid materials** and with an **optimum access to services**. However some vulnerable households of North Andros; less than 3% of all Bahamian households surveyed, have reported the absence of running water, toilet facilities or electricity in their own homes.

Concerning ownership of durable goods, **households can afford to buy almost all durable goods described in this study**, motor vehicles being the only material possession that 3.88% of households could not afford.

The interviewees' main concerns centred on their **neighbourhood needs**, for example the **asphalting of roads** (22% of interviewees) and the need for new **health centres** (11.6%). Chart 5 shows the main

neighbourhood needs identified in this study by region.

Bahamas' surveyed Region	Neighbourhood needs
North Andros	asphalting; health centre; rubbish collection
Mayaguana	asphalting; public school
Abaco	asphalting; health centre; water treatment plant; gas; public transport
Grand Bahama	asphalting; health centre; water treatment plant; gas; public school; rubbish collection; public transport.
Eleuthera	water treatment plan

Chart 5 Bahamian neighbourhoods' main needs

Education

In general terms, the family members of those working in the fisheries sector in The Bahamas have received primary or secondary education. Only 2.61% of illiteracy and semi-literacy have been reported. Tertiary education represents 6.72% of the individuals studied.

Economic capacity

Bahamian households do **not have a high dependency on their fisheries income**. Household members belonging to other sectors (services; tourism; state etc.) contribute to the household economy. Some **vulnerable households from North and Central Andros do not earn enough to reach the US\$ 1,500 per year to cover the necessities of each household member.**

Description of extractive fishing sector households surveyed.

According to the results **98.99% of the fishermen** interviewed in The Bahamas were **men**. In this profession, age distribution seems to be concentrated among those aged between 36 and 55 years old. This study reveals **a low participation in the sector by individuals of less than 25 years old.**

Fishermen's **households on average are composed of 2.57 persons**, 60% men and 40% women. Households are composed mainly of members between 36 and 55 years old, although there is also a significant percentage of members under 35 years. Family members over 56 years old do not exceed 12% of the household.

Economic importance of fishing.

Fishing is an important activity that contributes to the livelihood of households however in general, households with more than one source of income are more stable economically speaking. The fact that households belonging to the Bahamian fishing sector receive financial contributions from other sectors means that they are less dependent on fishing incomes (Bahamian households **Importance of Fishing within the Families Index 71.76%**). In addition, there is quite a low level of unemployment in this country resulting in a **relatively low Economic Dependency Index**. In this instance each employed household member must financially support 1.47 unemployed household members.

Fishing also contributes to household economy in terms of **food security** through consumption of the household's catch. According to FAOstat, each individual in the Bahamas consumes about 30 kilos of fishery products per year, which is well above the world average (16.7) (FAOstat 2007).

Fishing makes an **economic contribution on a local level** by impacting directly upon sales as well as having an indirect "upstream" and "downstream" impact on the commodity/supply chain. **In The Bahamas about 40% of each boat's costs are used to pay for fuel, 25.8% for crew wages and 11.3% for market taxes.** The rest is spent on paying for the oil, ice and bait needed, as well as for maintenance of the boat, gears and engine.

In The Bahamas fisheries products also have great economic benefits on a national scale due to the **exports** of spiny lobster, and queen conch among other.

Activity

Members of the extractive fishing sector in The Bahamas are engaged mainly in **harvesting**, but they also perform **processing activities. Marketing, gear and vessels construction and repair** are activities which are carried out **to a lesser extent**.

Productivity and profitability

In economic terms, Bahamian vessels are the most productive of this study. **The volume of catch is not high but the target species of the catch reach a high market value**, making the revenue generated by fishing vessels one of the highest in the CARICOM region.

A considerable **interest in investing in the modernization of the fleet has been noted**. 68.9% of respondents claimed to have spent money from their savings in the last 5 years to purchase equipment and a smaller percentage have purchased boats, engines and traps. 93% of respondents claim that in the next 5 years they will invest in improving their fishing equipment. **Buying new boats, fishing equipment and traps continue to be the main objectives of fishermen.** To do this, fishermen will make use of their own savings. Only **33.72% of fishermen interviewed had ever received a loan** for their income-generating fisheries activities. Only 35.29% of fishermen interviewed claim to have access to loans.

Training and skills

Taking into account the results of the study, only 17.31% of respondents in The Bahamas have received fisheries training.

This low figure indicates that **fisheries training should be enhanced**. Training should not only be oriented to improving the quality of fishery products, it should also be conducted to guarantee crew's safety and to improve fishing efficiency. In addition, it can be used to open up new avenues of income if it is decided to invest in processing and marketing.

Security systems

In The Bahamas 39% of fishermen interviewed said that they were participating in a social security system, with only 1.92% claiming to have received a government subsidy in the last 5 years, and 13.46% have received some form of non-governmental financial assistance.

Participation in a social security system should be promoted among the members of the extractive fishing sector so that they are able to receive both short-term and long-term social benefits.

Presence of cooperatives

According to this study, it would appear that **cooperatives** are not extensive in the Bahamas, with **only 9.6% of respondents claiming to belong to one.**

Enhancing the role of cooperatives is recommended as it constitutes a type of co-management in which government and users cooperate together as equal partners in the decision-making process. Cooperatives can also provide legal advice; credit or financial assistance; training; gear and equipment at more appropriate prices; help with the marketing and distribution of products, etc.

Co-management with fishermen's organizations results in increased stewardship as well as greater responsibility and authority among the fishermen.

Knowledge of policy regulations

The study shows that Bahamian fishermen **do not feel that they are involved in the decision-making process** as they are not consulted by the fisheries administration as individuals or through an association. Furthermore, fishermen only have an average **level of knowledge concerning the existence of national or regional strategies and management plans**, with only 38% of fishermen interviewed being familiar with them. Nevertheless **almost all** of them (99%) were **familiar with laws and regulations related to their sector.**

Environmental considerations

Sustainable development and exploitation of fishing resources can only be guaranteed through deep scientific knowledge of the marine ecosystem and biodiversity of the country, social awareness and systemic environmental control and monitoring.

Directives for improving good environmental practices as well as the marketing level and for the protection of rare species are key to the sustainability of resources.

From the results of the study, it can be said that **Bahamian fishermen are aware of the necessity of conserving resources, 71% of fishermen have observed a reduction in catches** in the recent years, and some of them indicate that have observed a reduction in size of species caught. Bahamian fishermen attribute this reduction in catches and size to **illegal fishing practices; to overfishing; to deterioration and destruction of habitats; to natural disasters and climate change.**

The decline in catches, the need to change target species and closed seasons are the main reasons why **Bahamian fishermen**

have to change fishing grounds up to four times a year.

The study reveals that **Bahamian fishermen are also aware of the importance of marine protected areas** and think that they have a positive impact on fishing. Over 63% of Bahamian fishermen interviewed are in favour on creating new marine protected areas.

Main concerns of the sector

Being aware of the needs and concerns of the sector is fundamental in establishing political and social action to strengthen fisheries and fisheries sector livelihoods.

The results of the study shows that Bahamian fishermen's main concerns are those related to the need to **seek new fishing grounds; illegal fishing; lack of financial assistance by the government; the loss of gear due to storms, hurricanes and vandalism.** Regarding issues related to marketing Bahamian fishermen seem concerned with **low sales prices and lack of adequate markets** for their fishing products.

Description of processing sector's households surveyed.

According to the results **80% of interviewees in the processing sector** in The Bahamas were men. In this profession, the age distribution seems to be restricted to those aged between 56 and 65 years old. The processing sector's **households are composed on average of 2.2 persons.**

Finance, investments and business growth expectations

A well developed and profitable processing sector is critical to the economy of a country as it economically **adds value to fisheries products**, and is a **source of employment**, especially for **women and individuals with low skill profiles.**

All Bahamian households belonging to the processing sector **meet the economic dependency criterion** established in the methodology of this study.

In The Bahamas the processing industry appears to be financed by national bank loans and/or partnerships. The industry seems to be well established as all companies surveyed intend to continue working and investing in the future modernization of the company and the training of its employees to further enhance business' productivity and profitability.

As previously mentioned, the general trend of those interviewed is the **interest in investing in modernization, enlargement and improvement of the business.**

All companies participating in this study seemed to provide their employees with **training courses.** The main courses are related to **handling of food and machinery, hygiene at work and Hazard Analysis and Critical Control Points (HACCP).**

Productivity and profitability

Most of the processing plants (**57%**) **do not operate at full capacity**, and only 66% are able to **supply their products throughout the whole year.**

Processing of **spiny lobster and conch** is the basis of fisheries product processing plants. They are frozen in order to be exported at a future date. The processing of various types of **groupers, lane snappers, and stone crabs** are other activities of the Bahamian processing industry. **Packaging and Distribution** activities are also carried out in an important proportion of Bahamian processing plants.

Raw material is purchased directly from local fishermen and boats that work for the

factory, to later be processed and **exported either at a regional or an international level.**

Revenues are based almost exclusively on sales, only 0.46% of revenues are related to subsidies or donations. As for expenses, they consist mainly of payment for raw material; for containers and packaging, for salaries and for supplies such as fuel, electricity or gas.

Employment and Security systems

Seasonal production conditioned the existence of full-time workers and part-time workers.

In general, most of the Bahamas full-time workers are men while most part-time workers are women. Women tend to occupy jobs between the semi-skilled levels to the professional ones, while more than half of men engage in professional jobs.

Normally part-time staff is composed of unskilled workers or semi-skilled ones. Their working activity is higher between August and December.

The skills of women seem to be underestimated in this sector. Participation in this sector by unemployed women should be strengthened.

In The Bahamas, companies are **involved in the social security system**; 80% of respondents claim to be participating in it. Also over **80% of processing plants are covered by some form of insurance**. On the other hand almost none of the companies have benefited from any government subsidy or non-governmental financial assistance in the last five years.

Presence of cooperatives

Cooperatives appear to be present in the Bahamian processing sector, but only 42% of companies claimed to be part of one. They only seem to be supported by half of the respondents.

In The Bahamas cooperatives mainly provide legal guidance, training and infrastructure for networking.

As stated previously, **co-management results in increased stewardship as well as greater responsibility and authority among the processing companies.**

Knowledge of policy regulations

The Study shows that Bahamian members of the processing sector **feel that they are quite involved in the decision-making process** as they are consulted from time to time by the administration during the planning processes. Nevertheless, they show a **high level of knowledge concerning the existence of national or regional processing industry development plans, and all of them are familiar with laws and regulations** related to their sector.

Environmental considerations

As for the relationship between the Bahamian processing industry and the environment, (with a few exceptions,) there has not been a significant **involvement in wastewater treatment, or in the solid waste** generated during processing activity. Only 16.67% of processing plants apply secondary treatment to wastewater and 20% resort to toxic waste disposal companies to manage solid waste.

The main source of energy used in the processing industry is electricity, and to a lesser extent fuel oil.

The Bahamian processing industry does not use raw material to obtain by-products.

In the Bahamian processing industry hygiene and sanitary controls of raw materials are fully implemented.

Main concerns of the sector

Being aware of the needs and concerns of the sector is fundamental in establishing political and social action to strengthen processing sector livelihoods.

The results of the study shows that the Bahamian processing sector's **main concerns are those related to bureaucratic problems; the difficulty in gaining access to electricity, in finding specialized staff and gaining access to loans; and those caused by natural hazards.**

The study also reveals that the main **development actions** for the processing sector demanded by the respondents are the **promotion and investment in the industry; the implementation of traceability, HACCP systems and quality certificates; boosting Research, Development and Innovation (R+D+I) ; and speeding up of administrative procedure.**

Recommendations

This is a brief review of some of the recommendations proposed in Section V of this report and in the Policy Document. For a more in-depth explanation it is recommended to use them.

- √ Policy processes should be improved by:
 - conducting regular reviews and analysis of policies.
 - Encouraging co-management.
- √ A Fishermen's Pension and Social Security Benefit Scheme should be established within a legal framework.
- √ Social measures to help the poorer households to meet the basic needs should also be established.
- √ A financial support plan should be developed and introduced, in strong collaboration with related financial agencies and governments, to provide fisherfolk and fisher's organizations with access to credit for investment in responsible fishing gear and technologies, safety gear and safer practices. The financial plan should include micro-finance schemes.
- √ Training programs should be continued.
- √ Sector awareness on relevant issues that directly affect its activity, such as resource protection / conservation, the need for team management, participation in decision-making process, etc, must be promoted.
- √ Fishery products market structure must be improved. Docks, markets, refrigerated storage and processing areas need building or renovating.
- √ Distribution must be improved by extending distribution channels allowing fish to reach as many island / areas as possible in the best condition.
- √ Measures designed to reduce post-capture loss should be reinforced.
- √ A Regular supply of fish to facilitate the organization of the market should be ensured.
- √ The administration in charge of managing fisheries should aim: to monitor fishing effort and enforce fishing regulations (MCS); to monitor fish stocks and advise on appropriate levels of exploitation of major commercial stocks; to report on the volume and value of production in the sector; to inform and instruct fishers on new technology through extension services. Fighting against IUU fishing and vandalism is key.
- √ Participation of women in the three sectors studied should be encouraged.
- √ Participation of the youth in the three sectors studied should be encouraged.
- √ Good environmental practices must be promoted among the three sectors studied.
- √ Promotion of the creation of marine protected areas.
- √ Conduct a study to determine the aquaculture potential of the country.

Main Findings of the Diagnostic Study to Determine the Levels of Poverty in Fishing Communities in Selected CARICOM Countries:

BARBADOS



Key facts³⁹

Population 2011 *	286,705
Direct and indirect jobs in fisheries sector	6,000
GDP Total 2009**	US\$3.6bn
Services **	80%
Industry **	17%
Agriculture **	3%
GDP by Sector Fisheries sector ***	0.4%

The sample studied

Surveys were conducted in all parishes with the exception of Saint Andrew. Christchurch, Saint Michael and Saint Philip were the parishes with the highest proportion of surveys conducted.

Chart 6 shows the number of surveys conducted in each parish studied. In this country aquaculture is almost negligible.

Sample parish	Aquaculture	Fisherman	Processing	Total
Saint George	1	1	-	2
Saint James	-	11	5	16
Saint Thomas	-	1	1	2
Christ Church	-	22	1	23
Saint Philip	-	15	-	15
Saint Michael	-	20	-	20
Saint John	-	5	-	5
Saint Peter	-	9	1	10
Saint Joseph	-	1	1	2
Saint Lucy	-	1	-	1
Total general	1	86	9	96

Chart 6 Completed questionnaires by sector and sample parish in Barbados

The extent of poverty in households of the Barbadian fisheries sector

In the data analysis no poor households were detected but **7.37% of vulnerable households** were observed in **St. Lucy, St. George, St. Joseph, St. James and St. Michael (Chart 7)**. All of the households surveyed in the rest of parishes met basic needs.

Barbados' surveyed parishes	Non-poor	Vulnerable	Poor	% Responses per parish
Saint Thomas	2.11%	0%	0%	2.11%
Saint John	5.26%	0%	0%	5.26%
Saint Peter	10.53%	0%	0%	10.53%
Saint Philip	15.79%	0%	0%	15.79%
Christ Church	23.16%	0%	0%	23.16%
Saint Lucy	0%	1.05%	0%	1.05%
Saint George	1.05%	1.05%	0%	2.11%
Saint Joseph	1.05%	1.05%	0%	2.11%
Saint James	14.74%	2.11%	0%	16.84%
Saint Michael	18.95%	2.11%	0%	21.05%
BARBADOS	92.63%	7.37%	0%	100%

Chart 7 Extent of poverty in households of the Barbadian fisheries sector.

Vulnerable households belonged to all **three fisheries sectors** and their main constraints are related to economic capacity and education. (Chart 8)

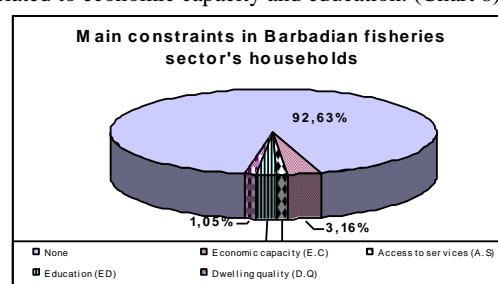


Chart 8 Main constraints in Barbadian fisheries sector households

Main Findings of the Study

³⁹ * CIA Factbook; ** 2011 Commonwealth Yearbook; *** National fisheries officers 2010

Chart 9 disaggregates by parish the vulnerabilities detected in the data analysis. **Special attention should be given to these regions and their needs.**

Parish	Constraints	Condition of household	Sector
Saint Lucy	Dwelling quality	vulnerable	extractive fishing
Saint George	Economic capacity	vulnerable	Aquaculture
Saint Joseph	Economic capacity	vulnerable	Processing
Saint Michael	access to services	vulnerable	extractive fishing
	Economic capacity		
Saint James	Education	vulnerable	Processing
			extractive fishing

Chart 9 Main constraints by parish. Barbados

Living conditions and access to services

In general, Barbadian dwellings **are undivided private houses built with solid materials** which have **optimum access to services**. However, some vulnerable households of St. Michael, less than 1.05% of all Barbadian households surveyed, have reported the absence of running water in their own home.

Concerning ownership of durable goods, **households could afford almost all durable goods described in this study**, motor vehicles and washing machines being the only material possessions that respectively 36.67% and 9.89% of households could not afford.

The interviewees' main concerns relating to their **neighbourhood needs** were the **asphalting of roads** (46% of interviewees); the need to strengthen **gas supply** (15.38%); the need to enhance **public transport**; and the investment in more **health centres** (7.69%). Chart 10 shows the neighbourhood's main needs by parish identified in this Study. To a greater or a lesser extent, all parishes surveyed seem to have the same needs.

Barbadian surveyed parishes	Neighbourhood needs
Christ Church	Asphalting
Saint James	Gas
Saint John	Asphalting
Saint Michael	Asphalting; Health centre
Saint Philip	Gas; Asphalting; Public transport

Chart 10 Barbadian neighbourhoods' main needs

Education

In general terms, family members of the three sectors studied in Barbados have received primary or secondary education regardless of their gender. Only 0.45% of semi-literacy has been reported. Tertiary education represents 14.29% of the individuals studied.

Economic capacity

Barbadian households do **not have a high dependency on their fisheries income**. Household members belonging to other sectors contribute to the household economy.

Only a few **vulnerable** households from **St. George, St. Joseph, and St. Michael do not** have enough earnings to **reach the US\$ 1,500 per year to cover the necessities of each household member**.

Description of extractive fishing sector households surveyed

According to the results, **96.51% of the fishermen** interviewed in Barbados were men. In this profession, age distribution seems to be concentrated among those aged between 36 and 65 years old, with those between 56 and 65 years of age representing 34.8% of the sample. This Study reveals a **low participation in the sector of individuals under 36 years old and a high participation of individuals over 56 year old**.

Fishermen's **households are composed on average of 2.3 persons**, 58.25% men

and 41.75% women. The results of this study indicate that Barbados is one of the countries with the highest aging population of the region, with fishermen's households made up of only 3.6% of individuals under 15 years old.

Economic importance of fishing

Fishing is an important activity that contributes to household livelihood; however households with more than one source of income are more stable economically speaking. The fact that households belonging to the Barbadian fishing sector receive financial contributions from other sectors means that they are less dependent on fishing incomes (Barbadian households **Importance of fishing within the Families Index 77.58%**). In addition, the relatively low unemployment rate and the small percentage of young people mean that the **Economic Dependency Index is quite low**. Each employed household member must financially support 1.30 unemployed household members.

Fishing also contributes to household economy in terms of **food security** through consumption of the household's catch. According to FAOstat, each individual in Barbados consumes about 43.39 kilos of fishery products per year: a quantity which is well above the world average (16.7) (FAOstat 2007).

Fishing makes an **economic contribution on a local level** by directly impacting sales as well as having an indirect "upstream" and "downstream" impact on the commodity/supply chain. **In Barbados about 50.6% of each boat's costs is used in paying the crew's wages; 18.24% in paying for ice for the day boats; 11.8% for fuel, and the rest is used to pay for oil, bait and licences and for the maintenance of the boat and gears.**

In Barbados fisheries products benefit the economy on a national level due to the **exports** of spiny lobster, and the revenues generated by the marketing of queen conch, flying fish and dolphinfish.

Activity

According to the results of the study, members of the extractive fishing sector in Barbados are not only engaged in **harvesting**, but they are also responsible for **processing and marketing**. **Gear and vessel construction and repair** are activities which are carried out to a **lesser extent**.

Productivity and profitability

In economic terms, Barbadian vessels are the second most productive of this study. **The volume of catch is the highest in the region, during both the high and low-season. During the high season catches generate high revenues per vessel and per number of crew members.** However it is important to mention that extractive fishing in Barbados is **highly conditioned by the season of the year**. Flying fish, their main target species, is captured from December to June, so an alternative occupation may be necessary if these families do not have other sources of income.

A reasonable **interest in investing in fleet modernization has been observed**. 62% of respondents claimed to have spent money from their savings in the last 5 years on boat improvements and in purchasing gears, equipment and to a lesser extent boats. 42% of respondents claim that they will invest in improving their fisheries activities in the next 5 years. **Boat improvements and buying a new boat continue to be the main objectives of fishermen.** To do this, fishermen will make use of their own savings. **Only 27% of fishermen** interviewed had ever received a **loan** for their income-

generating fisheries activities. Only 26% of fishermen interviewed claim to have access to loans.

Training and skills

Taking into account the results of the study, in Barbados, only 5.8% of respondents have received fisheries training.

This low figure indicates that **fisheries training should be enhanced**. Training should not only be oriented to improving the quality of fishery products, it should also be conducted to guarantee the crew's safety and to improve fishing efficiency. In addition, it can be used to open up new avenues of income if it is decided to invest in processing and marketing.

Security systems

In Barbados only 21% of fishermen interviewed said that they were participating in a social security system, 37.2% claimed to have received a government subsidy in the last 5 years, and 8.14% have received some form of non-governmental financial assistance.

Participation in a social security system should be promoted among the members of the extractive fishing sector so that they are able to receive both short-term and long-term social benefits.

Presence of cooperatives

According to this study, it would appear that **cooperatives** are not common in Barbados, **with 17.44% of respondents claiming to belong to one.**

Enhancing the role of cooperatives is recommended as it constitutes a type of co-management in which government and users cooperate together as equal partners in the decision-making process. Cooperatives can also provide legal advice; credit or financial assistance;

training; gear and equipment at more reasonable prices; and help with the marketing and distribution of products, etc.

Co-management with fishermen's organizations results in increased stewardship as well as greater responsibility and authority among the fishermen.

Knowledge of policy regulations

The Study shows that Barbadian fishermen **do not feel that they are involved in the decision-making process** as they are not consulted by the fisheries administration as individuals or through an association. Furthermore, they show a **medium level of knowledge concerning the existence of national or regional strategies and management plans**, with only 37% of fishermen interviewed being familiar with them. Nevertheless **a significant percentage (75.6%), are familiar with laws and regulations** related to their sector.

Environmental considerations

Sustainable development and exploitation of fishing resources can only be guaranteed through deep scientific knowledge of the marine ecosystem and biodiversity of the country, social awareness and systemic environmental control and monitoring.

Directives for improving good environmental practices and the marketing level, as well as the protection of rare species are key to the sustainability of resources.

From the results of the Study it can be said that **Barbadian fishermen are aware of the necessity to preserve resources; 47% of fishermen have observed a reduction in catches** in the recent years, and some of them indicate that have they observed a

reduction in the size of species caught. Barbadian fishermen mainly attribute this reduction in catches and size to **climate change and overfishing**, and to a lesser extent to **industrial, urban and construction on the sea-shore pollution**.

The decline in catches and the need to change the target species are the main reasons why almost all **Barbadian fishermen have to change fishing grounds up to four times a year**.

The Study also reveals that **Barbadian fishermen are aware of the importance of protected marine areas** and think that they have a positive impact on fishing. Over 79% of Barbadian fishermen interviewed are in favour on creating new protected marine areas.

Main concerns of the sector

Being aware of the needs and concerns of the sector is fundamental in establishing political and social action to strengthen fisheries and fisheries sector livelihoods.

The results of the Study show that Barbadian fishermen's main concerns are those related to the need to **seek new fishing grounds; the high prices of fuel and gears; and landing areas that do not meet the needs of the sector**. Regarding **issues related to marketing**, Barbadian fishermen seem concerned mainly with **low sales prices**, and to a lesser extent with **insufficient markets** for their fishing products and **lack of handling and preservation facilities**.

Description of processing sector's households surveyed

The processing sector in Barbados is mainly composed of **small-scale business**. According to the results, **all of the processing sector** interviewees were **women**. In this profession, the age distribution seems to be restricted to those

aged between 36 and 55 years old. Processing sector **households are composed on average of 3.13 persons**.

Finance, investments and business growth expectations

A well developed and profitable processing sector is critical to the economy of a country as it economically **adds value to fisheries products**, and is a **source of employment**, especially for **women and individuals with low skill profiles**.

In Barbados, the processing industry appears to be financed mainly by personal savings and to a lesser extent by the national bank. The industry seems to be well established as 85.11% of the companies surveyed intend to continue working in the future and 66% intend to continue investing in the modernization of the company.

As mentioned before, the general trend of those interviewed is the **desire to invest in improving the business**.

Half of the businesses participating in this Study seem to provide **training courses** to their workers. The main courses are related to **handling of food and Hazard Analysis and Critical Control Points (HACCP)**.

Productivity and profitability

Most of the processing businesses (**66.6%**) **do not operate at full capacity**, and none are able to **supply their products throughout the whole year**.

Processing of **flying fish** and **dolphinfish** is the basis of fisheries product processing plants. They are frozen or prepared and refrigerated to later be sold in local and national markets. The processing of various large pelagics such as **marlins, wahoo, billfish, swordfish and tunas** are other activities of the Barbadian processing industry. **Packaging and**

Distribution activities are also carried out in an important proportion of processing business.

Raw material is purchased directly from local fishermen and boats that work for the businesses. According to data obtained **exports are almost nonexistent.**

Revenues are based almost exclusively on sales, only 1.20% of revenues are related to subsidies or donations. Expenses include payment for insurance policies, raw material, transport, salaries and supplies such as fuel, electricity or gas.

Employment and Security systems

Seasonal production conditions lead to the existence of part-time workers.

Information obtained from the questionnaires was incomplete. From the partial data obtained, it can only be said that workers are women undertaking the tasks of skilled workers or middle services workers⁴⁰. Part-time jobs extend from December to March.

In Barbados, companies are **not very involved in the social security systems**, with only 43% of respondents participating in it. In addition, only **half of processing businesses are covered by some form of insurance**. In terms of financial assistance, only 20% of the processing businesses in Barbados claim to have received any kind of governmental subsidy and none of them have been assisted by non-governmental organizations.

Presence of cooperatives

Cooperatives seem to be present in Barbadian processing sector, but **only**

14% of companies claimed to be part of one.

In Barbados, cooperatives are involved in the **marketing** of processed products and in the **supply of raw material**.

As previously stated, **co-management results in increased stewardship as well as greater responsibility and authority among the processing companies.**

Knowledge of policy regulations

The Study reveals that Barbadian members of the processing sector **feel that they are not involved enough in the decision-making process** as only half of the members are consulted from time to time by the administration during the planning processes. In addition, they show a **low level of knowledge concerning the existence of national or regional processing industry development plans, and are not very familiar with laws and regulations** related to their sector.

Environmental considerations

As for the relationship between the Barbadian processing industry and the environment, no **involvement in wastewater treatment or in the solid waste** generated during processing activity has been observed. 20% of processing businesses use the solid waste to feed animals and the rest throw waste into garbage dumps or into the sea.

The main source of energy used in the processing industry is electricity, and to a lesser extent gas.

20% of Barbadian processing businesses obtain oil as by-products.

In the Barbadian processing industry, hygiene and sanitary controls of raw materials are only implemented in 40% of cases.

⁴⁰ It is presumed that Barbadian processing sector's workers are not exclusively women; lack of data is probably biasing gender information.

Main concerns of the sector

Being aware of the needs and concerns of the sector is fundamental in establishing political and social action to strengthen processing sector livelihoods.

The results of the Study show that the Barbadian processing sector's **main concerns are those related to the difficulty in gaining access to water: problems related to waste treatment and the difficulty in finding specialized staff.**

The study also reveals that the main **development actions** for the processing sector demanded by the respondents are **the implementation of traceability systems; the promotion and investment in the industry and the promotion of producer's organizations.**

Description of aquaculture sector's households surveyed

Aquaculture is a fledgling sector in Barbados. Only one aquaculture farm located in St. George participated in the study. This aquaculture plant works on a **subsistence** scale of production.

Finance, investments and business growth expectations

Aquaculture has been identified as a sector in the region that has considerable potential for improving social and economic conditions of rural and coastal people, whilst simultaneously contributing to regional and national economic growth, generating employment and earning foreign exchange.

In Barbados this aquaculture farm appears to be financed mainly **by international cooperation.** The overall impression is that this **subsistence** farm intends to **continue growing**, and as a result it is planned to invest money in breeding better

quality fingerlings and to install more breeding tanks.

The farm provides its staff with a training course related to fish handling, breeding and routine farm operations.

Activity

This fish farming facility is a **freshwater tank farm** operated as a **subsistence intensive culture in which reproduction, hatchery and nursery stages are carried out.** **Red tilapia** is the only species cultivated.

Productivity and profitability

The farm **works at 80% of its capacity, and is not able to supply products throughout the whole year.** The destination of products is the **local market;** fish is sold directly to the consumer. Revenues are based almost exclusively on sales, and expenses include payment for fish food and payment of supplies such as fuel, electricity or gas.

Employment and Security systems

No information was obtained concerning the staff and its **participation in the social security system.** The facility is **not covered by any form of insurance.** In terms of financial assistance the farm has only received financial support from non-governmental organizations; the government has not participated in its finance.

Presence of cooperatives

A Cooperative is involved in the running of the farm, contributing to the marketing of the fish products. **Co-management results in increased stewardship as well as greater responsibility and authority among the aquaculture companies.**

Knowledge of policy regulations

The Study shows that this subsistence facility is **not involved in the decision-making process** and is not aware of **national or regional aquaculture development plans, laws and regulations** related to their sector.

distribution and transport of aquaculture products.

Environmental considerations

As for the relationship between the Barbadian aquaculture industry and the environment, there is a high **involvement in wastewater treatment and in water recirculation**. The main source of water is rain water and aeration systems as well as filters are used.

The Barbadian farm considers that the quality of the source of water supply, the water in the facility, and wastewater treatments are key environmental aspects for operating a farm.

Main concerns of the sector

Being aware of the needs and concerns of the sector is fundamental in establishing political and social action to strengthen processing sector's livelihoods.

The results of the Study show that the Barbadian aquaculture sector's **main concerns** are related to bureaucracy problems; **difficulty in gaining access to electricity and marketing of products; and difficulty in finding specialized staff.**

The Study also reveals than the main **development actions** for the aquaculture sector demanded by the respondents are **the improvement of health control and product quality; speeding up the administrative procedures; the promotion of consumption and marketing opportunities for aquaculture products; the promotion of producer's organizations; and**

Recommendations

This is a brief review of some of the recommendations proposed in Section V of this report and in the Policy Document. For a more in-depth explanation it is recommended to use them.

- √ Policy processes should be improved by:
 - conducting regular reviews and analysis of policies.
 - Encouraging co-management.
- √ A Fishermen's Pension and Social Security Benefit Scheme should be established within a legal framework.
- √ A financial support plan should be developed and introduced, in strong collaboration with related financial agencies and governments, to provide fisherfolk and fishers' organizations with access to credit for investment in responsible fishing gear and technologies, safety gear and safer practices. The financial plan should include micro-finance schemes.
- √ Training programs should be continued.
- √ Sector awareness on relevant issues that directly affect its activity, such as resource protection, the need for team management, participation in decision-making process, etc, must be propelled.
- √ Fishery products market structure must be improved. Docks, markets, refrigerated storage and processing areas need building or renovating.
- √ Distribution must be improved by extending distribution channels allowing fish to reach as many communities as possible in the best condition.
- √ Measures designed to reduce post-capture loss should be reinforced.
- √ A Regular supply of fish to facilitate the organization of the market should be ensured.
- √ The administration in charge of managing fisheries should aim: to monitor fishing effort and enforce fishing regulations (MCS); to monitor fish stocks and advise on appropriate levels of exploitation of major commercial stocks; to report on the volume and value of production in the sector; to inform and instruct fishers on new technology through extension services. Fight against IUU fishing and vandalism is key.
- √ Participation of women in the three sectors studied should be encouraged.
- √ Participation of the youth in the three sectors studied should be encouraged.
- √ Good environmental practices must be promoted among the three sectors studied.
- √ Promotion of the creation of marine protected areas should be continued.
- √ Conduct a study to determine the aquaculture potential of the country.
- √ Productivity of Aquaculture farms might be enhanced, by carrying out projects to improve the production conditions of the growth units which are in operation, by improving the management of infrastructure, the acquisition of fishing equipment, building structures for fish manipulation and storage, etc. It will also assess the technological needs of energy supply and technology for the cultivation among others, and it will boost its acquisition, operation and maintenance.

Main Findings of the Diagnostic Study to Determine the Levels of Poverty in Fishing

Communities in Selected CARICOM Countries:



BELIZE

Key facts⁴¹

Population 2011 *	321,115
Net primary enrolment **	98%
Direct and indirect jobs in fisheries sector	2,369
GDP Total 2009**	US\$1.4bn
Services **	68%
Industry **	20%
GDP by Agriculture **	12%
Sector Fisheries sector ***	2.2%

The sample studied

Household surveys were conducted in the six districts of **Belize**; the highest numbers of interviews were conducted in Toledo, Stann Creek and Belize City.

Chart 11 shows the number of surveys conducted in each district studied.

Districts sampled	Aquaculture	Fisherman	Processing	Total
Belize City	10	14	2	26
Cayo	9	-	-	9
Orange Walk	7	-	-	7
Stann Creek	3	22	-	25
Toledo	6	26	1	33
Corozal	-	19	-	19
Total general	35	81	3	119

Chart 11 Completed questionnaires by sector and districts sampled in Belize

Main Findings of the Study

The extent of poverty in households of the fisheries sector in Belize

In the data analysis **25.6% of poor households** were detected and these are distributed in all **districts surveyed**. All poor households belong to the **aquaculture and the extractive fishing sector**.

⁴¹ * CIA Factbook; ** 2011 Commonwealth Yearbook; *** National fisheries officers 2010

19.6% of vulnerable households were detected in all districts surveyed with the exception of Cayo. Vulnerable households belong to the three sectors studied.

As can be seen from Chart 12 the percentage of vulnerable and poor households in Toledo and Corozal exceeds the percentage of non-poor households.

Belizean surveyed districts	Non-poor	Vulnerable	Poor	% Responses per district
Cayo	3.42%	0.00%	1.21%	4.63%
Belize City	16.24%	4.27%	1.71%	22.22%
Orange Walk	2.56%	1.71%	1.71%	5.98%
Stann Creek	15.38%	4.27%	1.71%	21.37%
Corozal	5.98%	3.42%	5.13%	14.53%
Toledo	11.11%	5.98%	11.11%	28.21%
BELIZE	54.70%	19.66%	25.64%	100%

Chart 12 Extent of poverty in households of the Belizean fisheries sector.

The main constraints of vulnerable and poor households are related mainly to dwelling quality and to a lesser extent to economic capacity.

Chart 13⁴² disaggregates by district the vulnerabilities detected in the data analysis. Special attention should be given to these regions and their needs.

Districts surveyed	Constraints	Condition of household	Sector
Cayo	4BN mainly DQ + EC	poor	Aquaculture
Belize City	DQ	vulnerable and poor	Aquaculture
	Ed		Extractive fishing
	EcC		
Orange Walk	EcC	vulnerable and poor	Aquaculture
	DQ		

⁴² UBN stands for Unsatisfied Basic Needs, DQ for dwelling quality, EcC for economic capacity, Ed for education, the fourth basic need is access to services

Districts surveyed	Constraints	Condition of household	Sector
	Ed		
Stann Creek	Ed	vulnerable and poor 1-2-4 UBN	Aquaculture
	DQ		Extractive fishing
	EcC		
Corozal	4BN mainly Ed	vulnerable and poor	Extractive fishing
Toledo	4BN mainly DQ and EcC	vulnerable	3 sectors
		poor	Aquaculture
		1-4UBN	Extractive fishing

Chart 13 Main constraints by district. Belize

Living conditions and access to services

In general, Belizean dwellings are undivided **private houses owned by their occupants. They are built with concrete or wood and roofed with sheets of metal.** It has been observed however that **5% of homes**, which have been **identified as poor**, are **made of inferior materials** such as earth and palm tree trunks for wall construction, and palm trees and cardboard and packaging wood for roofs.

Access to services is not as optimal as in the other countries studied. 1.68% of households, identified as **vulnerable in the Toledo district**, have to **leave their community to obtain access to running water.** The data also reflects that **some poor households do not have direct access (in the home) to running water, toilet facilities, and electricity, nor a drainage system for sewage removal. They do however have access to these resources in their communities.**

Concerning ownership of durable goods, a significant percentage of **households cannot afford to own motor vehicles (40%), washing machines (18%) or refrigerators (20%).**

The interviewees' main concerns relating to **neighbourhood needs** are the **asphalting of roads (17% of interviewees); the need to strengthen the drainage network (17%), gas supply (15%) and the need for new health centres (16.6%).**

Chart 14 shows the main neighbourhood's needs by district identified in this study.

Districts sampled	Neighbourhood needs
Belize City	Public school; Garbage dump; Water-treatment plant; Electricity; Gas; Public transport; Health centre; Drainage network; Asphalting; Rubbish collection
Cayo	Garbage dump; Electricity; Gas; Public transport; Health centre; Drainage network; Asphalting; Rubbish collection
Orange Walk	Electricity; Gas; Public transport; Drainage network; Asphalting; Rubbish collection
Stann Creek	Electricity; Gas; Public transport; Health centre; Drainage network; Asphalting; Rubbish collection
Toledo	Public school; Water-treatment plant; Electricity; Gas; Public transport; Health centre; Drainage network; Asphalting; Rubbish collection
Corozal	Public transport; Health centre; Drainage network; Asphalting; Rubbish collection

Chart 14 Main needs identified in Belizean neighbourhoods.

Education

In general terms, the family members of the fisheries sector in Belize have received primary or secondary education regardless of their gender. Illiteracy and semi-literacy was observed in 12% of individuals studied. Tertiary education represents 6.6% of individuals studied.

Economic capacity

Belizean households have the **highest dependency on their fisheries income.** Although household members belonging to other sectors contribute to the household economy, the high rate of young family members influences this high economic dependency.

The poor households in the districts of Belize City, Orange Walk and Toledo have an average household income that does not meet the financial needs of the average household members; households do not have enough earnings to reach the US\$ 1,500 per year to cover

the necessities of each household member.

Description of extractive fishing sector's households surveyed

According to the results of all the countries interviewed, **Belize is the country with the largest number of women working in the extractive sector: 8.86%** of the total. In this profession, the age distribution seems to be concentrated among those aged between 26 and 55 years old. In comparison with other countries **Belize has a remarkable percentage of fishermen between 15 and 25 years old.**

Fishermen's households are composed on average of **4.37 persons**, 53.3% men and 46.6% women. The results of this study indicate that Belize is one of the countries with the youngest population of the region.

Belizean fishermen's households have a much higher average of members per household than in other countries. If special attention is paid to the average number of household members in **poor Belizean households**, this average is even higher (6.7). **Overcrowding in poor Belizean households (3.55) is much higher than the country's household average (1.21).** Social measures should be taken to help these families; by determining their needs and seeking to improve on their quality of life.

Economic importance of fishing

Fishing is an important activity that contributes to household livelihood; however households with more than one source of income are more stable economically speaking. Households belonging to the Belizean fishing sector receive financial contributions from other sectors (Belizean households **Importance of fishing within the Families Index**

71.61%); however they have a relatively **high Economic Dependency Index.** Each employed household member must financially support 2.8 unemployed household members.

Fishing also contributes to household economy in terms of **food security** through consumption of the household's catch. According to FAOstat, in Belize each individual consumes about 12.51 kilos of fishery products per year, which is below the world average (16.7) (FAOstat 2007).

Fishing contributes to the economy at a local level by impacting directly upon sales as well as having an indirect "upstream" and "downstream" effect on the commodity / supply chain. **In Belize about 51% of each boat's costs are used in paying fuel, 19% in crew wages; 9% in paying for ice; and the rest is spent on paying the cooperatives' fees, oil, bait, licences and on the maintenance of boat and gears.**

In Belize fisheries products also reap great economic benefits on a national level due to the **exports** of spiny lobster and queen conch.

Activity

According to the results of the study, members of the extractive fishing sector in Belize not only are engaged in **harvesting**, they are also responsible for **marketing. Gear and vessel construction and repair** are activities carried out **to a lesser extent.**

Productivity and profitability

In economic terms, Belizean vessels have **a low economic productivity**, due to their low fishing capacity. The quantity captured by vessels as well as the earnings generated by each vessel are low. Artisanal fishing crafts use low power engines which contribute to a low profitability of catch

due to the time spent in travelling to the fishing area.

A moderate **interest in investing in fleet modernization has been observed**. 44% of respondents claimed to have spent money from their own savings in the last 5 years on boat improvements and to purchase gears and equipment. 52% of respondents claim that they will invest in improving their fisheries activities in the next 5 years. **Buying new gear and equipment continue to be the main objectives of fishermen**. In order to be able to do this, fishermen will make use of their own savings or will request a loan. **Only 15% of fishermen** interviewed had ever received a loan for their income-generating fisheries activities. 55.75% of fishermen interviewed claim to have access to loans.

Training and skills

Taking into account the results of the study, in Belize, only 27% of respondents have ever received fisheries training.

This low figure indicates that **fisheries training should be enhanced**. Training should not only be oriented to improving the quality of fishery products, but it should also be conducted to guarantee the crew's safety and to improve fishing efficiency. In addition, it is a means to open up new avenues of income if it is decided to invest in processing and marketing.

Security systems

In Belize only 33% of fishermen interviewed said that they were participating in a social security system, with only 1.23% claiming to have received a government subsidy in the last 5 years, and 5% claim to have received some form of non-governmental financial assistance. **Participation in the social security system should be promoted among the**

members of extractive fishing sector so that they are able to receive both short-term and long-term social benefits.

Presence of cooperatives

According to this study it would appear that **cooperatives** are extensive in Belize, with **44.44% of respondents claiming to belong** to one.

Enhancing the role of cooperatives is recommended as it constitutes a type of co-management in which government and users cooperate together as equal partners in the decision-making process. Cooperatives also can provide legal advice; credit or financial assistance; training; gear and equipment at more reasonable prices; help with the marketing and distribution of products, etc.

Co-management with fishermen's organizations results in increased stewardship as well as greater responsibility and authority among the fishermen.

Knowledge of policy regulations

The Study shows that Belizean fishermen **feel that they are quite involved in the decision-making process, with 51% saying that they are consulted by the fisheries administration**, as individuals or through an association. Furthermore, they show **a medium-high level of knowledge concerning the existence of national or regional strategies and management plans, with a significant percentage (95%) being familiar with laws and regulations** related to their sector.

Environmental considerations

Sustainable development and exploitation of fishing resources can only be guaranteed through deep scientific knowledge of the marine ecosystem and

biodiversity of the country, social awareness and systemic environmental control and monitoring.

Directives for improving good environmental practices, the marketing level and protection of rare species are key to the sustainability of resources.

From the results of the study, it can be said that **Belizean fishermen are aware of the necessity of conserving resources, 86% of fishermen have observed a reduction in catches** in the recent years, and 70% indicate that they have observed a reduction in size of species caught. Belizean fishermen mainly attribute this reduction in catches and size to **illegal fishing, overfishing, natural disasters and climate change**, and to a lesser extent to **inexperienced fishermen and to pollution from aquaculture farms and tourism**.

The decline in catches, the need to change target species and not over-exploit fishing grounds are the main reasons why **80% of Belizean fishermen have to change fishing grounds up to four times a year**.

The Study reveals that **Belizean fishermen are also aware of the importance of protected marine areas** and think that they have a positive impact on fishing. However despite this, over 69% of Belizean fishermen interviewed are **not in favour of creating new protected marine areas**.

Main concerns of the sector

Being aware of the needs and concerns of the sector is fundamental in establishing political and social action to strengthen fisheries and fisheries sector livelihoods. The results of the Study show that Belizean fishermen's main concerns are those related to the need to **seek new fishing grounds; illegal fishing; constraints in meeting supply and**

maintenance needs; and piracy of gears (shades / lobster traps). Regarding **issues related to marketing**, Belizean fishermen seem concerned mainly with **low sales prices**, and to a lesser extent with **insufficient markets** for their fish; **low demand** for the products and **lack of handling and preservation facilities**.

Description of processing sector's households surveyed

The processing sector in Belize is mainly composed of **businesses that have been running for more than twenty years**. According to the results, **66.6% of processing sector** interviewees were **men and 33.4% were women**. In this profession, the age distribution seems to be concentrated among respondents between 26 to 35 years old, although 33.3% of these were male of over 65 years. Processing sector **households are composed on average of 3.3 persons**.

Finance, investments and business growth expectations

A well developed and profitable processing sector is critical to the economy of a country as it economically **adds value to fisheries products**, and is a **source of employment**, especially for **women and individuals with low skill profiles**.

In Belize, the processing industry appears to be mainly financed by national bank loans and to a lesser extent by government assistance and partnerships. 66.6% of the companies surveyed intend to continue working in the future and also intend to continue investing in modernization of the company.

As mentioned before, the **interest in enlarging the processing area, building a storage facility or even diversifying to aquaculture (finfish) production** seems to be the general trend of those interviewed.

Businesses participating in this Study seem to provide **training courses** for their workers. The main courses include **management training, food handling, quality control and personal hygiene.**

Productivity and profitability

Most of the processing businesses (**66.6%**) **operate at full capacity**, and are able to **supply their products throughout the whole year**. Processing and **freezing** of shellfish such as **spiny lobster, shrimps and stone crabs** and of the gastropod **queen conch** is the basis of fisheries product processing plants. **Packaging and Distribution** activities are also carried out in an important proportion of processing businesses.

Raw material is purchased directly from local fishermen. With regards to the marketing of processed products, they are mainly exported on a regional and international level though there are also sales in the local and national market. The **main regional and international markets are Barbados and other CARICOM countries, USA, Mexico, Canada and Hong Kong.**

Revenues are based almost exclusively on sales, only 0.07% of revenues are related to subsidies or donations. Expenses include payment for raw materials (43.6%) and mortgages (43.6%) and to a lesser extent on payment of salaries and supplies such as fuel, electricity or gas.

Employment and Security systems

In terms of the personnel who work in businesses related to the processing industry, in general, most of the full-time workers in Belize are women. Women and men tend to occupy skilled and professional positions, though both also occupy middle service and semi-skilled jobs. No data has been found for the existence of part-time workers.

In Belize, **all companies participate in social security systems** and **66%** are **covered by some form of insurance**. In terms of financial assistance, **none of the processing businesses in Belize claim to have received any kind of governmental subsidy** and only 33% of them have been assisted by non-governmental organizations.

Presence of cooperatives

Cooperatives are fully involved in the Belizean processing sector, with all companies claiming to belong to a cooperative and to being satisfied with the services provided.

In Belize, cooperatives are involved in the **marketing** of processed products; in the **supply of raw material and energy as well as warehousing and in education**. **Co-management results in increased stewardship as well as greater responsibility and authority among the processing companies.**

Knowledge of policy regulations

The study shows that Belizean members of the processing sector **are fully involved in the decision-making process** as they are always consulted by the administration during the planning processes. They also show a **high level of knowledge concerning the existence of national or regional processing industry development plans and with laws and regulations** related to their sector.

Environmental considerations

As for the relationship between the Belizean processing industry and the environment, there is not a significant **involvement in wastewater treatment**. **Only 33.3% of processing plants apply primary treatment to wastewater**. **However 66% of companies use**

packaging waste management companies to manage their solid waste.

The main source of energy used in the processing industry is electricity, and to a lesser extent gas. No by-products are obtained.

In the Belizean processing industry, hygiene and sanitary controls of raw materials are fully implemented.

Main concerns of the sector

Being aware of the needs and concerns of the sector is fundamental in establishing political and social action to strengthen processing sector livelihoods.

The results of the study shows that the Belizean processing sector's **main concerns** are those related to **the difficulty in gaining access to loans and to marketing of products; difficulties in distribution and transport of products; difficulties in finding specialized staff and difficulties caused by natural disasters.**

The Study also reveals than the main **development actions** for the processing sector demanded by the respondents are **promotion of investment in the processing industry; promotion of the consumption and market opportunities for processed products; promotion of producer's organizations; improvements in distribution and transport of fish products; improvements in health control and product quality, as well as implementation of HAACCP systems and quality certificates.**

Description of aquaculture sector households surveyed

Aquaculture is almost a fledgling sector in Belize. According to the results, almost all of aquaculture sector's interviewees were men, with only 3% being women. The

bulk of age distribution of the interviewees is between 46 and 55 years old, but all age classes are represented. The aquaculture sector's households are composed on average of 5.8 persons.

Finance, investments and business growth expectations

Aquaculture has been identified as a sector in the region that has considerable potential for improving social and economic conditions of rural and coastal people, whilst simultaneously contributing to regional and national economic growth, generating employment and earning foreign exchange.

In Belize aquaculture farms appear to be financed mainly by **personal savings** and to a lesser extent by **partnerships, governmental assistance, foreign investments and international cooperation.**

65.7% of Belizean aquaculture farms intend to continue growing, and as a result it is planned to invest money in enlarging the facilities by building new ponds; investing in water recirculation systems and purchasing fish.

Staff training is not an extensive practice in Belizean aquaculture farms. **Training should be promoted. Having trained staff not only means improving the quality of a product, but it also involves development of human capacity and improvement of workers safety.**

Activity

In general terms, farming facilities in Belize are **freshwater pond farms developed as a small-scale extensive culture in which grow-out; reproduction; hatchery and nursery stages are practised.** The species cultivated are **red tilapia and mexican mojarra (*Cichlasoma urophthalmum*).**

In Belize, apart from small scale farms, the existence of 11.4% medium scale and 28.5% subsistence production farms were reported. Intensive and semi-intensive cultures were also reported.

Raceways and tanks are other types of cultures being practiced in Belize. Fish production is also oriented towards restocking and the ornamental market.

Productivity and profitability

In general terms, farms **work at half their capacity, and only 42% are able to supply products through the whole year.** The main destination of products is **national and local markets though regional exports and restocking and personal consumption are also important.** The majority of fish production is sold to retailers though direct sales, to consumers and to wholesalers.

Revenues are based almost exclusively on sales, whilst expenses centre on payment for the purchase of eggs and young fishes, maintenance activities, and payment of supplies such as fuel, electricity or gas.

Employment and Security systems

In Belizean aquaculture farms a significant proportion of full-time and part-time workers are non-salaried (they do not receive a wage) workers irrespective of gender. The rest of fulltime workers are semi-skilled or unskilled staff.

All salaried staff seem to be **participating in the social security system** and 66.6% of facilities are **covered by some form of insurance.** In terms of financial assistance, only 33.3% of farms have ever received financial support from non-governmental organizations and the government has not participated in financing businesses.

Presence of cooperatives

Cooperatives are fully involved in the Belizean aquaculture sector, with all companies claiming to belong to a cooperative and to being satisfied with the services provided.

In Belize, cooperatives are involved in the **marketing** of processed products; in the **supply of raw materials and energy, in warehousing and in education.**

Co-management results in increased stewardship as well as greater responsibility and authority among the aquaculture companies.

Knowledge of policy regulations

The study shows that Belizean members of the aquaculture sector **do not feel involved in the decision-making process** as 71% of them are never consulted during planning processes. They also demonstrate a **low level of knowledge concerning the existence of laws and regulations** related to their sector.

Environmental considerations

As for the relationship between the Belizean aquaculture industry and the environment, farms have a **low involvement in wastewater treatment: only 2.86%; and in water recirculation, only 14.71% of farms.** The main sources of water are rain-water or water from wells. **Aeration systems and filters are only used in 11.43% of the farms.**

Belizean farms consider that the quality of water supply sources and that of the water in the facility, as well as feeding and plant location are key environmental aspects for operating a farm.

Main concerns of the sector

Being aware of the needs and concerns of the sector is fundamental in establishing political and social action to strengthen processing sector's livelihoods.

The results of the Study shows that the Belizean aquaculture sector's **main concerns** are related to bureaucracy problems; **difficulty in gaining access to water; the low quality of water; difficulties in distribution and transport of products and the praedial larceny.**

The Study also reveals than the main **development actions** for the aquaculture sector demanded by the respondents are **the promotion of marketing opportunities for aquaculture products; promotion of producer's organizations; locating of zones and opportunities for the development of aquaculture; development and transfer of technology; speeding up of administrative procedures and improvements in health control and product quality and boosting Research, Development and Innovation (R+D+i).**

Recommendations

This is a brief review of some of the recommendations proposed in Section V of this report and in the Policy Document. For a more in-depth explanation it is recommended to use them.

- √ Policy processes should be improved by:
 - conducting regular reviews and analysis of policies.
 - Encouraging co-management.
- √ A Fishermen's Pension and Social Security Benefit Scheme should be established within a legal framework.
- √ Social measures to help the poorer households to meet the basic needs should also be established.
- √ A financial support plan should be developed and introduced, in strong collaboration with related financial agencies and governments, to provide fisherfolk and fishers' organizations with access to credit for investment in responsible fishing gear and technologies, safety gear and safer practices. The financial plan should include micro-finance schemes.
- √ Training programs should be continued.
- √ Sector awareness on relevant issues that directly affect its activity, such as resource protection/conservation, the need for team management, participation in decision-making process, etc, must be promoted.
- √ Fishery products market structure must be improved. Docks, markets, refrigerated storage and processing areas need building or renovating.
- √ Inland distribution must be improved by extending distribution channels allowing fish to reach as many inland areas as possible in the best condition.
- √ Measures designed to reduce post-capture loss should be reinforced.
- √ A Regular supply of fish to facilitate the organization of the market should be ensured.
- √ The administration in charge of managing fisheries should aim: to monitor fishing effort and enforce fishing regulations (MCS); to monitor fish stocks and advise on appropriate levels of exploitation of major commercial stocks; to report on the volume and value of production in the sector; to inform and instruct fishers on new technology through extension services. Fighting against IUU fishing and vandalism is key.
- √ Participation of women in the three sectors studied should be encouraged.
- √ Participation of the youth in the three sectors studied should be encouraged.
- √ Good environmental practices must be promoted among the three sectors studied.
- √ Promotion of the creation of marine protected areas should be continued.
- √ Conduct out a study to determine the aquaculture potential of the country.
- √ Productivity of aquaculture farms might be enhanced, by carrying out projects to improve the production conditions of the growth units which are in operation, by improving the management of infrastructure, the acquisition of fishing equipment, building structures for fish manipulation and storage, etc. It will also assess the technological needs of energy supply and technology for the cultivation among others, and it will boost its acquisition, operation and maintenance.

Main Findings of the Diagnostic Study to Determine the Levels of Poverty in Fishing Communities in Selected CARICOM Countries:

GRENADA

Key facts⁴³

Population 2011 *	108,419
Net primary enrolment **	93%
Direct and indirect jobs in fisheries sector	2,486
GDP Total 2009**	US\$1.4bn
Services **	78%
Industry **	16%
Agriculture **	6%
Fisheries sector ***	1.78%

The sample studied

Household surveys were conducted in all parishes including Carriacou and Petite Martinique; islands belonging to Grenada which have a status of dependency.

Chart 15 shows the number of surveys conducted in each parish studied. In this country aquaculture is almost negligible.

Grenada's surveyed parishes	Aquaculture	Fisherman	Processing	Total
St. George's	-	19	2	21
St. Mark's	-	15	-	15
St. John's	-	15	1	16
St. Patrick's	-	16	-	16
Petite Martinique	-	15	-	15
Carriacou	-	14	-	14
St. David's	-	2	-	2
St. Andrew's	-	28	-	28
Total general	-	124	3	127

Chart 15 Completed questionnaires by sector and parish sampled in Grenada

Main Findings of the Study

The extent of poverty in households of the Grenadian fisheries sector

In the data analysis **6.61% of poor households** distributed through the parishes of **St. John's; St. Andrews and St. Patricks** were detected. All poor

households belong to the extractive fishing sector.



25.62% of vulnerable households were also detected in the parishes surveyed with the exception of St. David. Vulnerable households also belong to the extractive fishing sector.

As can be seen from Chart 16, the percentage of vulnerable and poor households in St. Patrick exceeds the percentage of non-poor households.

Grenada's surveyed parishes	Non-poor	Vulnerable	Poor	% Response s per parish
St. David's	1.65%	0%	0%	1.65%
St. George's	12.40%	1.65%	0%	14.05%
St. Mark's	10.74%	1.65%	0%	12.40%
Carriacou	9.09%	2.48%	0%	11.57%
Petite Martinique	9.92%	2.48%	0%	12.40%
St. John's	7.44%	4.96%	0.83%	13.22%
St. Andrew's	13.22%	7.44%	2.48%	23.14%
St. Patrick's	3.31%	4.96%	3.31%	11.57%
GRENADA	67.77%	25.62%	6.61%	100%

Chart 16 Extent of poverty in households of the Grenadian fisheries sector.

The main constraints of vulnerable and poor households are related principally to **dwelling quality** and to a lesser extent to **access to services**.

Chart 17⁴⁴ disaggregates by parish the vulnerabilities detected in the data analysis. Special attention should be given to these regions and their needs.

Grenada's surveyed parishes	Constraints	Condition of household	Sector
St. George's	dwelling quality	vulnerable	Extractiv e fishing
St. Mark's	economic capacity	vulnerable	Extractiv e fishing
Carriacou	dwelling quality	vulnerable	Extractiv e fishing
Petite	Ec C; DQ	vulnerable	Extractiv

⁴³ * CIA Factbook; ** 2011 Commonwealth Yearbook; *** National fisheries officers 2010

⁴⁴ UBN stands for Unsatisfied Basic Needs, DQ for dwelling quality, EcC for economic capacity, Ed for education, AS for access to services

Grenada's surveyed parishes	Constraints	Condition of household	Sector
Martinique			e fishing
St John's	Ec C; ED; A.S	vulnerable and poor	Extractiv
St. Andrew's	Ec C; A.S; ED; DQ	vulnerable and poor	e fishing
St. Patrick's	Ec C; A.S; DQ	vulnerable and poor	Extractiv
			e fishing

Chart 17 Main constraints by parish. Grenada

Living conditions and access to services

In general, Grenadian dwellings are undivided **private houses owned by their occupants. They are built with wood, brick or cement blocks and roofed with sheets of metal.**

Access to services is not as optimal as in the other countries studied. 10.4% of households do not have direct access (in the house) **to running water**. To a lesser extent households also do not have access to **toilet facilities, electricity and drainage system for sewage removal**. Problems concerning access to these services have been observed in Saint John's, Saint Andrew's and Saint Patrick and mainly affect vulnerable and poor households.

Concerning ownership of durable goods, a significant percentage of **households cannot afford motor vehicles (42%), washing machines (25%) or refrigerators (11%).**

The interviewees' main concerns relating to their **neighbourhood needs** are the **asphalting of roads (22% of interviewees); a health centre (20%), the need to strengthen the drainage network (13%), water treatment plants (5%) and garbage dumps (5%).** Chart 18 shows the main neighbourhood's needs by parish identified in this study.

Grenada's surveyed parishes	Neighbourhood needs
St. George's	Public school; Water-treatment plant; Gas; Health centre; Drainage network; Asphalting
St. Mark's	Electricity; Health centre; Asphalting
St John's	Public school; Electricity; Health centre; Drainage network
St. Patrick's	Garbage dump; Water-treatment plant; Electricity; Public transport; Health centre
Petite Martinique	Asphalting
Carriacou	Garbage dump
St. David's	Drainage network; Asphalting
St. Andrew's	Public school; Garbage dump; Water-treatment plant; Gas; Public transport; Health centre; Drainage network; Asphalting; Rubbish collection

Chart 18 Grenadian neighbourhoods' main needs

Education

In general terms, family members of the fisheries sector in Grenada have received primary or secondary education regardless of their gender. Illiteracy and semi-literacy was observed among 4.21% of individuals studied. Tertiary education represents 8.4% of individuals studied.

Economic capacity

Grenadian households have a relatively high **dependency on their fisheries income.** Households receive little economic contribution from other sectors and an important percentage of household members are less than 15 years old.

In the poor households of parishes Saint John's and Saint Patrick's, the average household income does not meet the financial needs of the average household member; households do not earn enough to reach the US\$ 1,500 per year to cover the necessities of each household member.

Description of extractive fishing sector households surveyed

According to the results, **97.48% of the fishermen interviewed in Grenada were men**. In this profession, the age distribution seems to be concentrated among those aged between 26 and 55 years old. Fishermen aged between 36 and 45 years old represent 33.61% of interviewees. This study reveals that **in Grenada, this sector has a low participation of individuals of less than 26 years old and a high participation of individuals of over 36 years old**.

Fishermen's households are composed on average of **3.58 persons**, 58.77% men and 41.23% women. The results of this study indicate that Grenada is a country with a high percentage of young people.

Grenadian fishermen's households have a much higher average number of members per household than in other countries. In poor Grenadian households this average is even higher (6.8). Overcrowding in poor Grenadian households (3.25) is much higher than the country's household average (1.20). Social measures should be taken to help these families; by determining their needs and seeking to improve on their quality of life.

Economic importance of fishing

Fishing is an important activity that contributes to household livelihood; however households with more than one source of income are more stable economically speaking. Households belonging to the Grenadian fishing sector receive few financial contributions from other sectors (Grenadian households **Importance of fishing within the Families Index 87.63%**), and the high proportion of young household members contributes to a **high Economic Dependency Index**. Each employed

household member must financially support 2.02 unemployed household members.

Fishing also contributes to household economy in terms of **food security** through consumption of the household's catch. According to FAOstat, each individual in Grenada consumes about **36.97** kilos of fishery products per year, which is well above the world average (16.7) (FAOstat 2007).

Fishing contributes to the economy on a **local level** by impacting directly upon sales as well as having an indirect "upstream" and "downstream" impact on the commodity/supply chain. **In Grenada about 47.55% of costs are used to pay the crew's wages; 26.52% for fuel, 8.43% for bait and the rest is spent on paying for oil, ice, the cooperatives fees and for maintenance of boat and gears.**

Activity

According to the results of the study, members of the extractive fishing sector in Grenada are not only engaged in **harvesting; marketing, construction and repair of gears and vessels are activities carried out to a lesser extent**.

Productivity and profitability

In economic terms Grenadian vessels have a **medium economic productivity** compared with other countries participating in the Study, due to their medium fishing capacity. The quantity captured by a vessel as well as the earnings generated by each vessel are neither the highest nor the lowest in the Region.

A significant **interest in investing in fleet modernization has been observed**. 57.5% of respondents claimed to have spent money from their own savings in the last 5 years on boat improvements and on the purchase of boats, engines and gears.

87.38% of respondents claim that they will invest in improving their fisheries activities in the next 5 years. **The purchase of new boats, engines and gears continue to be the main objectives of fishermen.** In order to be able to do this, fishermen will mainly request a loan. **38.18% of fishermen** interviewed had received a loan for their income-generating fisheries activities and 34.5% of fishermen interviewed claim to have access to loans.

Training and skills

Taking into account the results of the study, in Grenada, only 19% of respondents have received fisheries training.

This low figure indicates that **fisheries training should be enhanced.** Training should not only be oriented to improving the quality of fishery products, but it should also be conducted to guarantee the crew's safety and to improve fishing efficiency. In addition, it can be used to open up new avenues of income if it is decided to invest in processing and marketing.

Security systems

In Grenada only 29% of fishermen interviewed said that they were participating in a social security system, with 43% claiming to have received a government subsidy in the last 5 years, and only 10.5% have ever received some form of non-governmental financial assistance. **Participation in a social security system should be promoted among members of extractive fishing sector so that they are able to receive both short-term and long-term social benefits.**

Presence of cooperatives

According to this Study it would appear that **cooperatives** are not extensive in Grenada, with **29% of respondents**

claiming to belong to one. In spite of this, half of respondents believe that cooperatives would improve their situation. **Enhancing the role of cooperatives is recommended as it constitutes a type of co-management in which government and users cooperate together as equal partners in the decision-making process.** Cooperatives also can provide legal advice; credit or financial assistance; training; gear and equipment at more reasonable prices; help with the marketing and distribution of products, etc.

Co-management with fishermen's organizations results in increased stewardship as well as greater responsibility and authority among the fishermen.

Knowledge of policy regulations

The Study shows that Grenadian **fishermen do not feel involved in the decision-making process** as they are not consulted by the fisheries administration, neither as individuals nor as associations. Furthermore, they show a **medium level of knowledge concerning the existence of national or regional management plans.** Nevertheless, a **significant percentage (89%), were familiar with laws and regulations** related to their sector.

Environmental considerations

Sustainable development and exploitation of fishing resources can only be guaranteed through deep scientific knowledge of the marine ecosystem and biodiversity of the country, social awareness and systemic environmental control and monitoring.

Directives for improving good environmental practices and the marketing level as well as the protection of rare species are key to the sustainability of resources.

From the results of the Study, it can be said that **Grenadian fishermen are aware of the necessity to preserve resources, 66% of fishermen have observed a reduction in catches** in the recent years, and 50% indicate that have observed a reduction in size of species caught. Grenadian fishermen mainly attribute this reduction in catches and size to **overfishing, natural disasters and climate change, illegal fishing**, and to a lesser extent **deterioration or destruction of habitats**, and **industrial, urban, agriculture and aquaculture pollution**.

The need to change target species, the decline in catches, the necessity to adapt to the tides and prevention of over-exploiting fishing grounds are the main reasons why **94% of Grenadian fishermen have to change fishing grounds up to four times a year**.

The Study reveals that **Grenadian fishermen are also aware of the importance of protected marine areas** and think that they have a positive impact on fishing. Over 76% of Grenadian fishermen interviewed are **in favour of creating new protected marine areas**.

Main concerns of the sector

Being aware of the needs and concerns of the sector is fundamental in establishing political and social action to strengthen fisheries and fisheries sector livelihoods.

The results of the Study show that Grenadian fishermen's main concerns are those related to the need to **seek new fishing grounds; problems regarding infrastructures for unloading; illegal fishing; constraints meeting supply and maintenance needs; problems regarding industrial fishermen; and piracy and vandalism**. Regarding **issues related to marketing**, Grenadian fishermen seem concerned mainly with **insufficient markets; low sales prices**, and to a lesser

extent with the low demand for products and **lack of handling and preservation facilities**.

Description of processing sector's households surveyed

The processing sector in Grenada is mainly composed of **businesses that have been running for fifteen years, though a third of these are more recent (less than 5 years old)**. According to the results, **66.6% of processing sector interviewees were men of over 65 years old, the rest were also men between 26-35 years old**. Processing sector **households are composed on average of 2 persons**.

Finance, investments and business growth expectations

A well developed and profitable processing sector is critical to the economy of a country as it economically **adds value to fisheries products**, and is a **source of employment**, especially for **women and individuals with low skill profiles**.

In Grenada, the processing industry appears to be financed mainly by national bank loans and to a lesser extent by partnerships. 66.6% of the companies surveyed intend to continue working in the future and also intend to continue investing in modernization of the company. As mentioned before, those interviewed were **interested in building storage facilities processing area and cold rooms**. **All Businesses** participating in this Study seem to provide **training courses** for their workers. The main courses are related to **quality control, Hazard Analysis and Critical Control Points (HACCP) and customer relations**.

Productivity and profitability

Most of the processing businesses (**66.6%**) **operate at full capacity** however they are

not able to supply their products throughout the whole year.

The importance of **ocean pelagic fishery** is also reflected in Grenadian processing industry: yellow-fin tuna, albacore, black-fin tuna, blue marlin, Atlantic sailfish, wahoo and swordfish are **frozen for both export and to be sold on the national market**. Flying fish and dolphinfish are also frozen and various types of snappers are prepared or vacuum-packed. **Packaging and Distribution** activities are also carried out in an important proportion of processing businesses.

Raw material is mainly purchased directly from local fishermen but direct purchases are also made from boats that work for the factory and some material is imported. With regards to the marketing of processed products, they **are mainly exported on an international level** though there are also **sales on the national market**. All **international exports** are sold in the USA market.

Revenues are based mainly on sales, but 16.13% of incomes are related to subsidies or donations. Expenses include the amortization of tangible fixed assets (92.35%); and payment for raw material (2.27%), salaries and supplies such as fuel, electricity or gas.

Employment and Security systems

In terms of the personnel who work in businesses related to the processing industry, most of the Grenadian full-time workers are men. Women and men tend to occupy skilled and professional jobs as well as middle service and semi-skilled jobs.

In Grenada, **66% of companies participate in the social security system and are covered by some form of insurance**. In terms of financial assistance, **66% of the processing businesses claim**

not to have received any kind of governmental subsidy, and none of them have been assisted by non-governmental organizations.

Presence of cooperatives

Cooperatives seems to be present in the Grenadian processing sector, **with 33% of companies claiming to belong to one and to being satisfied with the services provided.**

In Grenada, cooperatives are involved in the **marketing** of processed products; in the **supply of raw material and energy, and in warehousing.**

Co-management results in increased stewardship as well as greater responsibility and authority among the processing companies.

Knowledge of policy regulations

The Study shows that Grenadian members of the processing sector **are fully involved in the decision-making process** as they are always consulted by the administration during the planning processes. They also show a **high level of knowledge concerning the existence of national or regional processing industry development plans and with laws and regulations** related to their sector.

Environmental considerations

As for the relationship between the Grenadian processing industry and the environment, there is a significant **involvement in wastewater treatment: 33.3% of processing plants apply primary treatment to wastewater, and 66.7% apply secondary treatment**. In terms of management of solid waste, most of the companies use garbage dumps while 33.3% of them use the solid waste to feed animals.

The main source of energy used in the processing industry is electricity, and to a lesser extent fuel oil. No by-products are obtained.

In the Grenadian processing industry, hygiene and sanitary controls of raw materials are implemented in 66.7% of businesses.

Main concerns of the sector

Being aware of the needs and concerns of the sector is fundamental in establishing political and social action to strengthen processing sector livelihoods.

The results of the Study show that the Grenadian processing sector's **main concerns** are those related to **difficulty in: fulfilment of environmental requirements, transport of the product, finding specialized staff, and gaining access to water. Another concern is referred to waste water treatment.**

The Study also reveals that the main **development actions** for the processing sector demanded by the respondents are **promotion of investment in the processing industry; promotion of the consumption and market opportunities for processed products; promotion of producer's organizations; improvements in health control and product quality; development and transfer of technology; training of specialised technicians and speeding up of administrative procedures.**

Recommendations

This is a brief review of some of the recommendations proposed in Section V of this report and in the Policy Document. For a more in-depth explanation it is recommended to use them.

- √ Policy processes should be improved by:
 - conducting regular reviews and analysis of policies.
 - Encouraging co-management.
- √ A Fishermen's Pension and Social Security Benefit Scheme should be established within a legal framework;
- √ Social measures to help the poorer households to meet the basic needs should also be established.
- √ A financial support plan should be developed and introduced, in strong collaboration with related financial agencies and governments, to provide fisherfolk and fishers' organizations with access to credit for investment in responsible fishing gear and technologies, safety gear and safer practices. The financial plan should include micro-finance schemes.
- √ Training programs should be continued.
- √ Sector awareness on relevant issues that directly affect its activity, such as resource protection/conservation, the need for team management, participation in decision-making process, etc, must be promoted.
- √ Fishery products market structure must be improved. Docks, markets,

refrigerated storage and processing areas need building or renovating.

- √ Distribution must be improved by extending distribution channels allowing fish to reach as many communities as possible in the best condition.
- √ Measures designed to reduce post-capture loss should be reinforced.
- √ A Regular supply of fish to facilitate the organization of the market should be ensured.
- √ The administration in charge of managing fisheries should aim: to monitor fishing effort and enforce fishing regulations (MCS); to monitor fish stocks and advise on appropriate levels of exploitation of major commercial stocks; to report on the volume and value of production in the sector; to inform and instruct fishers on new technology through extension services. Fighting against IUU fishing and vandalism is key.
- √ Participation of women in the three sectors studied should be encouraged.
- √ Participation of the young in the three sectors studied should be encouraged.
- √ Good environmental practices must be promoted among the three sectors studied.
- √ Promotion of the creation of marine protected areas.
- √ Conduct a study to determine the aquaculture potential of the country.

Main Findings of the Diagnostic Study to Determine the Levels of Poverty in Fishing Communities in Selected CARICOM Countries:

GUYANA

Key facts⁴⁵

Population 2011 *	744,768
Net primary enrolment **	95%
Direct and indirect jobs in fisheries sector	17,400
GDP Total 2009**	US\$1.2bn
Services **	47%
Industry **	33%
Agriculture **	20%
GDP by Sector	
Fisheries sector ***	2.5%

The sample studied

Household surveys were conducted just in the coastal regions with the exception of Barima. The regions with the highest number of respondents were Essequibo Islands (West Demerara) and Demerara-Mahaica.

Chart 19 shows the number of surveys conducted in each region studied.

Guyana's surveyed Regions	Aquaculture	Fisherman	Processing	Total
Region # 2	1	26	-	27
Region # 3	9	40	1	50
Region # 4	1	29	14	44
Region # 5	3	17	-	20
Region # 6	4	21	1	26
Total general	18	133	16	167

Chart 19 Completed questionnaires by sector and region sampled in Guyana

Main Findings of the Study



The extent of poverty in households of the fisheries sector in Guyana

In the data analysis 24.24% of poor households distributed all over the regions surveyed were detected. All poor households belong to the aquaculture and extractive fishing sector.

25.45% of vulnerable households were also detected over all regions surveyed. Vulnerable households belong to the three sectors studied.

As can be seen in Chart 20, in Regions 5, 2 and 3 the percentage of vulnerable and poor households exceeds the percentage of non-poor households. **Almost half the households surveyed were considered vulnerable or poor.**

Guyana's surveyed Regions	Not Poor	Vulnerable	Poor	% Responses per Region
Region # 4	20.00%	3.64%	3.03%	26.67%
Region # 6	8.48%	4.24%	3.03%	15.76%
Region # 5	3.64%	3.64%	4.24%	11.52%
Region # 2	5.45%	4.85%	5.45%	15.76%
Region # 3	12.73%	9.09%	8.48%	30.30%
GUYANA	50.30%	25.45%	24.24%	100%

Chart 20 the extent of poverty in Guyana's fisheries sector's households.

The main constraints of vulnerable and poor households are related mainly to **economic capacity and dwelling quality**.

Chart 21 ⁴⁶ disaggregates by region the vulnerabilities detected in the data analysis. Special attention should be given to these regions and their needs.

⁴⁵ * CIA Factbook; ** 2011 Commonwealth Yearbook; *** National fisheries officers 2010

⁴⁶ UBN stands for Unsatisfied Basic Needs, DQ for dwelling quality, EcC for economic capacity, ED for education, A.S for access to services. P.S stands for processing sector; E.F.S for extractive fishing sector and Aq. S for aquaculture sector

Guyana's surveyed Regions	Constraints	Condition of household	Sector
Region # 4	Ec C; DQ; ED	Vulnerable Poor	P.S ; E.F.S Extractive fishing
Region # 6	Ec C; DQ; ED; A.S	Vulnerable Poor	P.S ; E.F.S Aq.S; E.F.S
Region # 5	Ec C; DQ; ED	Vulnerable Poor	Aq.S; E.F.S Extractive fishing
Region # 2	Ec C; DQ; ED	Vulnerable and poor	Extractive fishing
Region # 3	Ec C; DQ; ED	Vulnerable Poor	Aq.S; E.F.S Extractive fishing

Chart 21 Main constraints by region. Guyana

Living conditions and access to services

In general, Guyana's dwellings are **undivided private houses owned by their occupants. They are built with wood, cement or brick and roofed with sheets of metal.** However it has been observed that **1.25% of homes, which have been identified as poor are made of inferior materials** such as mud and palm tree trunks for wall construction.

Access to services is not as optimal as in the other countries studied. 0.6% of households have to **resort to their community to have access to toilet facilities; shower; bath or drainage system.** A high rate of DK/NA answers influences the rate of Guyana households accessibility to services.

Concerning ownership of durable goods, a significant percentage of **households cannot afford to have motor vehicles (47.8%), washing machines (35.20%) or refrigerators (13.7%).** Results show that they are desirable goods.

The interviewees' main concerns related to their **neighbourhood needs** are the **asphalting of roadways (19% of interviewees); the need to strengthen the drainage network (19%), rubbish collection (14%) and electricity (7%).** Chart 22 shows the main neighbourhood

needs by region identified in this Study. All regions surveyed, to a greater or a lesser extent, seem to have the same needs.

Guyana's surveyed Regions	Neighbourhood needs
Region # 2	Electricity; Public transport; Health centre; Drainage network; Asphalting; Rubbish collection
Region # 3	Garbage dump; Water-treatment plant; Electricity; Gas; Public transport; Health centre; Drainage network; Asphalting; Rubbish collection
Region # 4	Electricity; Water-treatment plant; Gas; Health centre; Drainage network; Asphalting; Rubbish collection
Region # 5	Electricity; Drainage network; Asphalting; Rubbish collection
Region # 6	Public school; Garbage dump; Electricity; Drainage network; Asphalting; Rubbish collection

Chart 22 Neighbourhoods' main needs in Guyana

Education

In general terms, the family members of the fisheries sector in Guyana have received primary or secondary education regardless of their gender. Illiteracy and semi-literacy have been observed in 11% of individuals studied. Tertiary education is represented by 4% of the individuals studied.

Economic capacity

Guyana households **do not experience a high dependency on fisheries income.** Households receive major economic contributions from other sectors that contribute to financially support the large percentage of household members under 15 years old.

In all regions of Guyana, the average household income is insufficient to meet the financial needs of the average household members of those parishes; households do not have enough earnings

to reach the US\$ 1,500 per year required to cover the necessities of each household member.

Description of extractive fishing sector households surveyed

According to the results **95.56% of the fishermen** interviewed in Guyana were men. In this profession, the age distribution seems to be concentrated among those aged between 36 and 55 years old. The ones aged between 36 and 45 years old represent 40% of interviewees. This Study reveals **in Guyana a low participation in the sector of individuals under 26 years old and a high participation of individuals over 36 years.**

Fishermen's households are composed on average of **4.37 persons**, 51.04% men and 48.96% women. The results of this study indicate that Guyana is one of the countries with the youngest population of the region.

In Guyana, fishermen's households have a much higher average number of members per household than in other countries. If special attention is paid to the average number of members in **poor households**, it will be noticed that **this figure is even higher (5.8).** **Overcrowding in Guyana's poor households (2.9) is much higher than in the country's household average (1.78).** Social measures should be taken to help these families; by determining their needs and seeking to improve their quality of life.

Economic importance of fishing

Fishing is an important activity that contributes to household livelihood, but households with more than one source of income are more stable economically speaking. Households belonging to Guyana's fishing sector receive financial

contributions from other sectors (Guyana's households **Importance of fishing within the Families Index 78.08%**), but as seen above, that does not avoid having a **high Economic Dependency Index**; each employed household member must financially support 2.02 unemployed household members.

Fishing also contributes to household economy in terms of **food security** through consumption of the household's catch. According to FAOstat, in Guyana each individual consumes about 33.3 kilos per year of fishery products, well above the world average (16.7) (FAOstat 2007).

Fishing makes an **economic contribution at the local level** by providing direct impacts related to sales as well as indirect impacts "upstream" and "downstream" through the commodity/supply chain. **In Guyana about 39% of each boat's costs are used in paying fuel, 19.25% in paying for ice, and 11% in crew wages; and the rest is spent in paying for the cooperatives fees, oil, bait, licences and the maintenance of boat and gears.**

Activity

According to the results of the study, members of the extractive fishing sector in Guyana are not only engaged in **harvesting**, they are also responsible for the **marketing and gear and vessel construction and repair. Processing and aquaculture production** are activities carried out to a lesser extent.

Productivity and profitability

Guyana's vessels focus their fishing activities within 60 km of the coast, and in 8 hour tides reach a considerable volume of catches, though not all boats use engines, and if they are used they are low power. So technically speaking, the fishing capacity per unit of power invested in fishing is the highest among all countries studied,

however **the low sale prices do not turn this technical productivity into a significant economic one.**

A significant **interest in investing in fleet modernization has been observed.** 65% of respondents claimed to have spent money from their savings in the last 5 years in boat improvements and in the purchase of gear, engines and boats. 49% of respondents claim that they will invest in the next 5 years in improving their fishery activities. **Buying new boats; engines and gear continue to be the main objectives of fishermen.** To do this, fishermen will make use of their own savings or will request a loan. **37.5% of fishermen** interviewed had at some time received **a loan** for their income-generating fishery activities. 41% of fishermen interviewed claim to have access to loans.

Training and skills

Taking into account the results of the study, in Guyana, only 9.77% of respondents have received fishery training.

This low figure indicates that **fishery training should be enhanced.** Training should not only be oriented to improving the quality of fishery products, but it should also be conducted to guarantee the crew's safety and to improve fishing efficiency. In addition, it can be used to open up new avenues of income if it is decided to invest in processing and marketing.

Security systems

In Guyana only **2% of fishermen** interviewed said that they were participating in **a social security** system, with only 0.75% claiming to have received a government subsidy in the last 5 years, and 1.5% to have received some form of non-governmental financial assistance.

Participation in a social security system should be promoted among the members of the extractive fishing sector so they could receive both short-term and long-term social benefits.

Presence of cooperatives

According to this Study, it would appear that **cooperatives** are not extensive in Guyana, with **23.3% of respondents claiming to belong** to one.

Enhancing the role of cooperatives is recommended as it constitutes a type of co-management in which government and users cooperate together as equal partners in the decision-making process. Cooperatives can also provide legal advice; credit or financial assistance; training; gear and equipment at more reasonable prices; help with the marketing and distribution of products, etc.

Co-management with fishermen's organizations results in increased stewardship as well as greater responsibility and authority among the fishermen.

Knowledge of policy regulations

The Study shows that Guyana's fishermen **do not feel that they are involved in the decision-making process; with only 2.26% saying that they** are consulted by the fisheries administration, as individuals or through associations. Furthermore, they show **a low level of knowledge concerning the existence of national or regional strategies and management plans and only 66.9% of them were familiar with laws and regulations related to their sector.**

Environmental considerations

Sustainable development and exploitation of fishing resources can only be guaranteed through deep scientific knowledge of the marine ecosystem and biodiversity of the country, social awareness and systemic environmental control and monitoring.

Directives for improving good environmental practices, protection of rare species caught and marketing level are crucial for the sustainability of resources.

From the results of the Study, it can be said that **Guyana's fishermen are not aware of the necessity of conserving the resources**, though 93% of fishermen have observed a reduction in catches in recent years, 43.6% of them are not in favour of creating more protected areas in their country, and 24% do not care if they are created or not. 20.3% of respondents believe that these protected areas do not have any impact at all on fishing. **Given these results, it is important to find out the reason for this way of thinking and see if created protected areas are well planned and implemented and how they affect fishermen's activity. If the objectives are being met, then the fishermen should be informed of the importance of protected areas in fisheries.**

Fishermen that have observed a decrease in catches, mainly attribute this reduction to **climate change, overfishing** and to a lesser extent to **industrial fishing, illegal fishing and inexperienced fishermen.**

The decline in catches, the need to change target species and the necessity to adapt to the tides are the main reasons why 82% of Guyana's **fishermen have to change fishing grounds up to four times a year.**

Main concerns of the sector

Being aware of the needs and concerns of the sector is fundamental in establishing political and social action to strengthen fisheries and fisheries sector livelihoods.

The results of the Study show that Guyana's fishermen's main concerns are those related to the need to **seek new fishing grounds; regarding infrastructures for unloading; illegal fishing; constraints in meeting supply and maintenance needs; problems regarding industrial fishermen; problems finding crew; piracy and vandalism.** Regarding issues related to marketing, Guyana's fishermen seem concerned mainly with **low sale prices**, and to a lesser extent with **insufficient markets** for their fishery products; **low demand** for the products and **lack of handling and preservation facilities.**

Description of the processing sector households surveyed

The processing sector in Guyana is mainly composed of **businesses that have been running more than twenty years.** According to the results, **62.5% of processing sector interviewees were men and 37.5% were women.** In this profession, the age distribution seems to be concentrated on respondents between 26 to 65 years old. **Processing sector households are composed on average of 3.81 persons.**

Finance, investments and business growth expectations

A well developed and profitable processing sector is critical to the economy of a country as it economically **adds value to fishery products**, and is **a source of employment**, especially for **women and individuals with low skill profiles.**

In Guyana the processing industry appears to be financed mainly by national bank loans and savings and to a lesser extent by

partnerships or foreign investments. 75% of the companies surveyed intend to continue working in the future and also intend to continue investing in the modernization of the company.

As mentioned before, the general trend of those interviewed is the **interest in investing in meeting EU standards to become EU certified facilities; investing in drying systems; expansion of cold storage facilities.**

Businesses participating in this study seem to provide **training courses** to their workers. The main courses are related to **Hazard Analysis and Critical Control Points (HACCP) ISO 2000 and standard operating procedures; hygiene and processing techniques.**

Productivity and profitability

In Guyana, only 6% of the companies operate at full capacity but 61% are able to supply their products throughout the whole year.

The industry is dominated by the **processing of shrimps such as seabob and white belly shrimp** that can be headed, peeled and frozen or may be commercialized as salted. Green weakfish (*Cynoscion virescens*) and Bangamary (*Macrodon ancylodon*), frozen and filleted, are also important, as is the processing of several catfishes (Ariidae); jacks (Carangidae); and snappers (Lutjanidae). **Packaging and Distribution** activities are also carried out in a large proportion of processing businesses.

Raw material is purchased directly from local fishermen and boats that work for the factory. Also raw material can be purchased from fishermen from other communities, and from aquaculturists. With regard to the **marketing** of processed products, they are mainly exported either at a regional or international level. There

are also sales in local and national markets. **The main regional markets are Barbados, Trinidad and Tobago and other CARICOM countries, and at the international level, Hong Kong, USA, Europe and Canada.**

Revenues are based exclusively on sales. As for expenses, they focus on payment for raw material (66.26%); supplies such as fuel, electricity or gas (10.9%); payment of salaries (7%); containers and packaging (6%) and to a lesser extent on payment for rentals or mortgages.

Employment and Security systems

In terms of the personnel who work in businesses related to the processing industry, in general, most of the Guyana's full-time workers are men, while most part-time workers are women. In Guyana, almost all jobs have the status of semi-skilled or unskilled, regardless of sex, although 80% of women carry out tasks of unskilled staff.

In Guyana, **86% of companies are involved in the social security systems and 35.7% are covered by some form of insurance.** In terms of financial assistance, **53.3% of the processing businesses claim to have received some kind of government subsidy** and only 7.14% of them have been assisted by non-governmental organizations.

Presence of cooperatives

Cooperatives seem to be present in Guyana's processing sector, **but only 50% of companies claim to be part of one.** These businesses are **satisfied with the services provided.**

In Guyana, cooperatives are involved in **legal guidance; education and energy supply.**

As mentioned previously, **co-management results in increased stewardship as well as greater responsibility and authority among the processing companies.**

Knowledge of policy regulations

The Study shows that Guyana's members of the processing sector **are highly involved in the decision-making process**, as 85.7% of them are consulted by the administration during the planning processes. They also show a **full level knowledge concerning laws and regulations** related to their sector.

Environmental considerations

As for the relationship of Guyana's processing industry and the environment, a significant **involvement in wastewater treatment** has been observed. **87.5% of processing plants apply primary treatment to wastewater. In terms of management of solid waste, most of the companies use it to feed animals; incineration and garbage dumps are the other routes used in the management of solid waste.**

The main source of energy used in the processing industry is electricity, and to a lesser extent firewood or fuel oil. Glue and shrimp food are obtained as by-products.

In 87% of Guyana's processing businesses, hygiene and sanitary controls of raw materials are fully implemented.

Main concerns of the sector

Being aware of the needs and concerns of the sector is fundamental in establishing political and social action to strengthen processing sector livelihoods.

The results of the Study show that the **main concerns** of Guyana's processing

sector are those related to **problems regarding supply of raw material and other supplies; difficulties in finding specialized staff and in distribution and transport of products; and the fulfilment of environmental requirements.**

The Study also reveals that the main **development actions** for the processing sector demanded by the respondents are **promotion of investment in the processing industry; implementation of traceability systems and quality certificates; training of specialised technicians and speeding up of administrative procedures.**

Description of the aquaculture sector households surveyed

Aquaculture in Guyana is a relatively new activity; however, people on the Corentyne Coast have practiced a form of fishery enhancement that is similar to aquaculture for over 100 years. Several attempts have been made over the years to develop freshwater and brackish water aquaculture especially since local consumer demand for freshwater fish is high.

According to the results almost all of the aquaculture sector interviewees were men; only 17.65% were women. The bulk of age distribution of the interviewees was between 46 and 55 years old, but all age classes are represented. The aquaculture sector households are composed on average of 3.06 persons.

Finance, investments and business growth expectations

Aquaculture is still in the developmental stage. Data are not recorded separately for aquaculture but its contribution to the economy at present is considered negligible. While there is **great potential for aquaculture to impact positively on the economy in terms of social and**

economic development, income generation and provision of employment, these effects will only be observed when the aquaculture industry has had a chance to develop further.

In Guyana aquaculture farms appear to be financed mainly by **personal savings** and to a lesser extent by **national bank loans; governmental assistance; partnerships** or **international cooperation**.

82% of Guyana's aquaculture farms intend to continue growing, and for that it is planned to invest money in enlarging the facilities by building new ponds or investing in Jamaican red tilapia and Nile tilapia culture.

Staff training is an extended practice in half of Guyana's aquaculture farms. Main courses focus on aquaculture management; water quality testing; and handling, harvesting and feeding techniques.

FAO's National Aquaculture Overview report informs that the Mon Repos Freshwater Aquaculture Demonstration Farm and Training Centre is one of the centres responsible for staff training. Training should be promoted. Having trained staff not only means improving product quality, but also involves the development of human capacity and improvement of worker safety.

Activity

Aquaculture activities in Guyana can be divided into freshwater and brackish water, almost all of which are practiced on the coastal plains.

All aquaculture activities are practiced on the Low Coastal Plain and **pond culture of tilapia and giant river prawn is the main farming system while rice-fish farming using tilapia has been introduced on an experimental basis.**

The aquaculture systems generally use **freshwater** supplied from a series of water trapping structures referred to locally as conservancies. These conservancies (Boeraserie Conservancy, East Demerara Conservancy and Canje Creek) release water into a system of irrigation canals draining ultimately into the Atlantic Ocean. Irrigated farming systems include mainly rice and sugar cane cultivation. The main target species of freshwater cultures are **Nile and Jamaican red tilapia; giant river / freshwater prawn; and armoured catfish.**

11% of farms use **brackish water**, which involves the opening of sea defences and taking advantage of tidal inflows. During high tides, juveniles, larvae, eggs, etc. are trapped in coastal polders and in some cases specially constructed enclosures near the foreshore where they are allowed to mature to marketable size. The main target species are **seabob, white belly shrimp and mullet (*Mugil spp*)**⁴⁷.

In general terms, farming facilities in Guyana are **exploited as subsistence or small-scale culture, in which grow-out and nursery stages are the most abundant, but also reproduction, hatchery and brood stock stages are carried out to a lesser extent.**

In Guyana the existence of 22% and 11% of medium and large scale production farms was also reported. In addition, intensive and semi-intensive cultures were reported.

Fish production is not only oriented to production; restocking, and the processing industry, are other uses.

Productivity and profitability

Only 29.4% of Guyana's farms **work at full capacity, and only 50% are able to supply products throughout the year.**

⁴⁷ FAO's National aquaculture sector overview.

The main destination of the production is **international export (41.41% of production)** and **local market (31.5%) sales**; though **national market sales, restocking and personal consumption are also important**. Most of fish production is sold directly to members of their community (51%), but direct sale to wholesalers (28.5%) and retailers also exists.

Revenues are based mainly on unspecified types of income and on sales; as for expenses, they focus on payment for mortgages (48.4%) and repairs and maintenance (42.6%) and to a lesser extent on staff salaries, food and eggs and young fish.

Employment and Security systems

In Guyana's aquaculture farms a major part of full-time workers are unskilled workers without differences in gender. The rest occupy the remaining types of jobs also regardless of sex. No information was obtained on part-time workers.

Only 23.5% of salaried staff seems to be **participating in the social security systems** and 11.11% of facilities are **covered by some form of insurance**. In terms of financial assistance, only 22.22% of farms have received any government subsidy and 16.67% have received financial support by non-governmental organizations.

Participation in a social security system should be promoted among the members of the aquaculture sector in order for them to receive both short-term and long-term social benefits. **The production of value-added products should also be encouraged through the provision of appropriate incentives.**

Presence of cooperatives

Cooperatives are present in Guyana's aquaculture sector, but only 61% of interviewees claim to belong to a cooperative and only 20% are satisfied with the services provided.

In Guyana, cooperatives are involved in representing farms in the Water Users Association, which is in charge of supplying irrigation water; they are also responsible for education; **marketing** of processed products; the **supply of fingerlings, food and energy and providing legal guidance.**

Co-management is a power- and cost-sharing partnership that capitalizes on the knowledge and capacities of user groups and the government to create more legitimate, sustainable, equitable, and effective management systems.

An example of co-management is **The National Aquaculture Association of Guyana (NAAG)** which is a public-private partnership with support from the Ministry of Agriculture's Department of Fisheries and international donors; and formed to facilitate the establishment and growth of a sustainable aquaculture industry in Guyana.

Knowledge of policy regulations

The Study shows that Guyana's members of the aquaculture sector **only feel slightly involved in the decision-making process** as 50% of them are never consulted by the administration during the planning processes. They also show **a low level knowledge concerning the existence of laws and regulations** related to their sector.

Environmental considerations

As for the relationship of Guyana's aquaculture industry and the environment,

a low involvement in wastewater treatment, only 22% of farms; and in water recirculation, only 47% of farms, has been observed. The main sources of water are rain-water and irrigation systems, though sea and river water and water from reservoirs and wells are also used. **Aeration systems and filters are used in 50% of the farms.**

Guyana's farms consider that feeding; quality of the water supply source and of the water in the facility; and plant location, are key environmental aspects for operating a farm.

Main concerns of the sector

Being aware of the needs and concerns of the sector is fundamental in establishing political and social action to strengthen processing sector livelihoods.

The results of the Study show that the main concerns of Guyana's aquaculture sector are related to **the fulfilment of environmental requirements; difficulty in gaining access to water and difficulties in distribution and transport of products.**

The Study also reveals that the main **development actions** for the aquaculture sector demanded by the respondents are **training of specialised technicians; promotion of producers organizations; promotion of marketing opportunities and consumption of aquaculture products; promotion of producer's organizations; improvements in health control and product quality and boosting R+D+I.**

Recommendations

This is a brief review of some of the recommendations proposed in Section V of this report and in the Policy Document. For a more in-depth explanation it is recommended to use them.

- √ Policy processes should be improved by:
 - conducting regular reviews and analysis of policies.
 - Encouraging co-management.
- √ A Fishermen's Pension and Social Security Benefit Scheme should be established within a legal framework.
- √ Social measures to help the poorer households to meet the basic needs should also be established.
- √ A financial support plan should be developed and introduced, in strong collaboration with related financial agencies and governments, to provide fisherfolk and fishers' organizations with access to credit for investment in responsible fishing gear and technologies, safety gear and safer practices. The financial plan should include micro-finance schemes.
- √ Training programs should be continued.
- √ Sector awareness on relevant issues that directly affect its activity, such as resource protection/ conservation, the need for team management, participation in decision-making process, etc, must be promoted.
- √ Fishery products market structure must be improved. Docks, markets, refrigerated storage and processing areas need building or renovating.
- √ Inland distribution must be improved by extending distribution channels allowing fish to reach as many inland areas as possible in the best condition.
- √ Measures designed to reduce post-capture loss should be reinforced.
- √ A Regular supply of fish to facilitate the organization of the market should be ensured.
- √ The administration in charge of managing fisheries should aim: to monitor fishing effort and enforce fishing regulations (MCS); to monitor fish stocks and advise on appropriate levels of exploitation of major commercial stocks; to report on the volume and value of production in the sector; to inform and instruct fishers on new technology through extension services. Fighting against IUU fishing and vandalism is key.
- √ Participation of women in the three sectors studied should be encouraged.
- √ Participation of the youth in the three sectors studied should be encouraged.
- √ Good environmental practices must be promoted among the three sectors studied
- √ Promotion of the creation of marine protected areas should be continued.
- √ Consider carrying out a study to determine the aquaculture potential of the country.
- √ Productivity of aquaculture farms might be enhanced, by carrying out projects to improve the production conditions of the growth units which are in operation, by improving the management of infrastructure, the acquisition of fishing equipment, building structures for fish

manipulation and storage, etc. It will also assess the technological needs of energy supply and technology for the

cultivation among others, and it will boost its acquisition, operation and maintenance.

Main Findings of the Diagnostic Study to Determine the Levels of Poverty in Fishing



Communities in Selected CARICOM Countries:

JAMAICA

Key facts⁴⁸

Population 2011 *	2,868,380
Direct and indirect jobs in fisheries sector	20,000
GDP Total 2010**	US\$24bn
Services*	64%
Industry*	30%
Agriculture*	6%
Fisheries sector **	0.25%

The sample studied

Household surveys were conducted in all parishes, with Saint Catherine being the one with the highest number of interviews conducted.

Chart 23 shows the number of surveys conducted in each parish studied.

Jamaica's surveyed parishes	Aquaculture	Fisherman	Processing	Total
Clarendon	13	30	-	43
Hanover	3	20	-	23
Kingston	23	28	-	51
Manchester	1	19	-	20
Portland	1	20	-	21
Saint Andrew	5	18	2	25
Saint Ann	5	20	-	25
Saint Catherine	70	44	-	114
Saint Elizabeth	4	26	1	31
Saint James	2	20	-	22
Saint Mary	3	20	-	23
Saint Thomas	4	24	1	29
Trelawny	2	20	-	22
Westmoreland	3	31	1	35
Total general	139	340	5	484

Chart 23 Completed questionnaires by sector and districts sampled in Jamaica

Main Findings of the Study

The extent of poverty in households of the Jamaican fisheries sector

In the data analysis **11.46% of poor households** distributed all over the **parishes surveyed** were detected. All poor households belong to the **aquaculture and the extractive fishing sector**.

27.39% of vulnerable households were also detected in the parishes surveyed. Vulnerable households belong to all three sectors studied.

As can be seen from Chart 24, in Hanover; St. Mary; Manchester and Portland the percentage of vulnerable and poor households exceeds the percentage of non-poor households.

Jamaica's surveyed parishes	Non-Poor	Vulnerable	Poor	% Responses per Region
Westmoreland	5.10%	1.91%	0.21%	7.22%
Saint Elizabeth	3.61%	1.27%	0.42%	5.31%
Trelawny	3.18%	0.85%	0.64%	4.67%
Saint Ann	2.76%	1.91%	0.64%	5.31%
Clarendon	5.52%	2.55%	0.64%	8.70%
Saint Thomas	3.61%	1.91%	0.64%	6.16%
Kingston	6.58%	3.61%	0.64%	10.83%
Saint James	2.76%	1.06%	0.85%	4.67%
Hanover	2.34%	1.70%	0.85%	4.88%
Saint Mary	1.70%	2.34%	0.85%	4.88%
Saint Andrew	3.18%	0.85%	1.27%	5.31%
Manchester	1.91%	1.06%	1.27%	4.25%
Portland	1.49%	1.70%	1.27%	4.46%
Saint Catherine	17.41%	4.67%	1.27%	23.35%
JAMAICA	61.15%	27.39%	11.46%	100%

Chart 24 Extent of poverty in households of the Jamaican fisheries sector.

The main constraints of vulnerable and poor households are related mainly to **access to services and dwelling quality**.

⁴⁸ * CIA Factbook; ** National fisheries officers 2010

Chart 25⁴⁹ disaggregates by parish the vulnerabilities detected in the data analysis. **Special attention should be given to these regions and their needs.**

Jamaica's surveyed parishes	Constraints	Condition of household	Sector
Westmoreland	Ec C; A.S; ED; DQ	Vulnerable	P.S ; E.F.S
		Poor	Extractive fishing
Saint Elizabeth	Ec C; A.S; ED; DQ	Vulnerable	Extractive fishing
		Poor	Aq.S; E.F.S
Trelawny	A.S; DQ; Ec C	Vulnerable	Aq.S; E.F.S
		Poor	Extractive fishing
Saint Ann	Ec C; A.S; ED; DQ	Vulnerable and poor	Extractive fishing
Clarendon	DQ; A.S; ED	Vulnerable and poor	Extractive fishing
Saint Thomas	Ec C; A.S; ED; DQ	Vulnerable	P.S ; E.F.S; Aq. S
		Poor	Extractive fishing
Kingston	Ec C; DQ; A.S	Vulnerable	Aq.S; E.F.S
		Poor	Extractive fishing
Saint James	Ec C; A.S; ED; DQ	Vulnerable and poor	Extractive fishing
Hanover	Ec C; A.S; ED; DQ	Vulnerable and poor	Extractive fishing
Saint Mary	Ec C; A.S; ED; DQ	Vulnerable and poor	Extractive fishing
Saint Andrew	Ec C; A.S; ED; DQ	Vulnerable	Aq.S; E.F.S
		Poor	Extractive fishing
Manchester	Ec C; A.S; ED; DQ	Vulnerable and poor	Extractive fishing
Portland	Ec C; A.S; ED; DQ	Vulnerable and poor	Extractive fishing
Saint Catherine	Ec C; A.S; ED; DQ	Vulnerable	Aq.S; E.F.S
		Poor	Extractive fishing

Chart 25 Main constraints by parish. Jamaica

Living conditions and access to services

In general, Jamaican dwellings are undivided private houses owned by its occupants. They are built with cement blocks or wood and roofed with sheets of metal. However, it has been observed that some homes, which have been identified as poor, are made of inferior materials such as earth and palm tree trunks and waste materials.

⁴⁹ UBN stands for Unsatisfied Basic Needs, DQ for dwelling quality, EcC for economic capacity, ED for education, A.S for access to services. P.S stands for processing sector; E.F.S for extractive fishing sector and Aq. S for aquaculture sector

Access to services is not as optimal as in the other countries studied. 0.42% of households do not have access in their community to running water or drainage system for water removal. The data also reflects that from 6.3% to 16.18% of the respondents do not have direct access (at the household level) to running water, toilet facilities, electricity, kitchen, shower, telephone, or drainage system for sewage removal.

Concerning ownership of durable goods, a significant percentage of households cannot afford motor vehicles (49.8%), washing machines (39.5%) or refrigerators (13%). Results show that they are desirable goods.

The interviewees' main concerns related to their neighbourhood needs are the asphaltting of roadways (26.4% of interviewees); the need to strengthen the drainage network (12.8%), rubbish collection (10.3%) and new health centres (10.7%). Chart 4 shows the main neighbourhoods' needs by parish identified in this study. All parishes surveyed, to a greater or a lesser extent, seem to have the same needs.

Jamaica's surveyed parishes	Neighbourhood needs
Clarendon Saint Andrew Saint Catherine	Public school; Garbage dump; Water-treatment plant; Electricity; Gas; Public transport; Health centre; Drainage network; Asphaltting; Rubbish collection
Hanover	Public transport; Health centre; Drainage network; Asphaltting; Rubbish collection
Kingston	Public school; Electricity; Gas; Health centre; Drainage network; Asphaltting; Rubbish collection
Manchester	Public school; Health centre; Drainage network; Asphaltting; Rubbish collection
Portland	Water-treatment plant; Electricity; Public transport; Health centre; Drainage network; Asphaltting; Rubbish collection

Jamaica's surveyed parishes	Neighbourhood needs
Saint Ann	Garbage dump; Water-treatment plant; Electricity; Public transport; Health centre; Drainage network; Asphaltting; Rubbish collection
Trelawny Saint Elizabeth	Public school; Water-treatment plant; Electricity; Gas; Public transport; Health centre; Drainage network; Asphaltting; Rubbish collection
Saint James	Water-treatment plant; Electricity; Drainage network; Asphaltting; Rubbish collection
Saint Mary	Garbage dump; Water-treatment plant; Electricity; Public transport; Health centre; Drainage network; Asphaltting; Rubbish collection
Saint Thomas	Garbage dump; Water-treatment plant; Electricity; Gas; Public transport; Health centre; Drainage network; Asphaltting; Rubbish collection
Trelawny	Public school; Water-treatment plant; Public transport; Health centre; Drainage network; Asphaltting; Rubbish collection
Westmoreland	Public school; Water-treatment plant; Electricity; Gas; Public transport; Health centre; Drainage network; Asphaltting; Rubbish collection

Chart 26 Jamaican neighbourhoods' main needs

Education

In general terms, the family members of the fisheries sector in Jamaica have received primary or secondary education regardless of their gender. Illiteracy and semi-literacy have been observed in 2.35% of individuals studied. Tertiary education is represented by 8.11% of the individuals studied.

Economic capacity

Jamaican households have a significant **dependency on fishery income**. Household members do not tend to belong to other sectors, so households do not receive economic contributions from other sources of revenue. Jamaica also has a high rate of young family members

influencing this high economic dependency.

Hanover; Portland; St. Andrew; St. Elisabeth and Westmoreland are the parishes with poor households, where the average household income is insufficient to meet the financial needs of the average household members of those parishes; households do not have enough earnings to reach the US\$ 1,500 per year to cover the necessities of each household member.

Description of extractive fishing sector households surveyed

According to the results, **98.48% of the fishermen** interviewed in Jamaica were men. In this profession, the age distribution seems to be concentrated among those aged between 36 and 55 years old. Fishermen between 26 and 35 years of age are also representative (19.39%). This Study reveals **in Jamaica a low participation in the sector of individuals under 26 years old and a high participation of individuals over 36 years old.**

Fishermen's households are composed on average of **3.63 persons**, 57.48% men and 42.52% women. The results of this Study indicate that Jamaica is one of the countries with the youngest population of the region.

Jamaican fishermen's households are composed by an average number of members per household and per room (overcrowding) much higher than in other countries. If special attention is paid to the average number of household members in Jamaican households, it will be noticed that this figure is even higher (5.7). **Overcrowding in Jamaican poor households (3.05) is much higher than in the country's household average (1.42).** Social measures should be taken to help these families; by determining their

needs and seeking to improve their quality of life.

Economic importance of fishing

Fishing is an important activity that contributes to household livelihood, but households with more than one source of income are more stable economically speaking. Households belonging to the Jamaican fishing sector barely receive financial contributions from other sectors (Jamaican households **Importance of fishing within the Families Index 85.98%**), and the high proportion of young household members contributes to a **high Economic Dependency Index**; each employed household member must financially support 2.28 unemployed household members.

Fishing also contributes to household economy in terms of **food security** through consumption of the household's catch. According to FAOstat, in Jamaica each individual consumes about 30.56 kilos per year of fishery products, well above the world average (16.7) (FAOstat 2007).

Fishing makes an **economic contribution at the local level** by providing direct impacts related to sales as well as indirect impacts "upstream" and "downstream" through the commodity/supply chain. **In Jamaica about 41% of each boat's costs are used in paying crew wages; 35% in paying fuel, 7% in paying for the bait; 5% in paying for ice; and the rest is spent on paying for oil, licences and the maintenance of boat and gear.**

In Jamaica fishery products also bring great economic benefits at the national level due to the **exports** of spiny lobster and queen conch.

Activity

According to the results of the Study, members of the extractive fishing sector in

Jamaica are not only engaged in the **harvesting**, they are also responsible for the **marketing. Gear and vessel construction and repair** are activities carried out **to a lesser extent.**

Productivity and profitability

In economic terms, Jamaican vessels have **a low economic productivity, above all in low season**, due to their low fishing capacity. The pounds captured per vessel as well the earnings generated per vessel are low. Artisanal fishing crafts use low power engines which contribute to a low profitability of catch due to the time spent to arrive at the fishing area.

A significant interest in investing in fleet modernization has been observed. 77.8% of respondents claimed to have spent money from their savings in the last 5 years in boat improvements and in the purchase of gear, boats; engines and equipment. 78.66% of respondents claim that they will invest in the next 5 years in improving their fishery activities. **Buying new gear, boats, engines and equipment continue to be the main objectives of fishermen.** To do this, fishermen will make use of their own savings or will request a loan. **Only 10% of fishermen** interviewed had ever received **a loan** for their income-generating fishery activities; and only 24% claim to have access to them.

Training and skills

Taking into account the results of the study, in Jamaica, only 16% of respondents have received fishery training.

This low figure indicates that **fishery training should be enhanced.** Training should not only be oriented to improving the quality of fishery products, it should also be conducted to guarantee the crew's safety and to improve fishing efficiency. In addition, it can be used to open up new

avenues of income if it is decided to invest in processing and marketing.

Security systems

In Jamaica only 34% of fishermen interviewed said that they were participating in a social security system, with only 5% claiming to have received a government subsidy in the last 5 years, and 6.4% to have received some form of non-governmental financial assistance.

Participation in a social security system should be promoted among the members of the extractive fishing sector in order for them to receive both short-term and long-term social benefits.

Presence of cooperatives

According to this Study it would appear that **cooperatives** are not very extensive in Jamaica, with **34.6% of respondents claiming to belong** to one. In spite of that, half the respondents believe in the proper functioning of cooperatives.

Enhancing the role of cooperatives is recommended as it constitutes a type of co-management in which government and users cooperate together as equal partners in the decision-making process. Cooperatives can also provide legal advice; credit or financial assistance; training; gear and equipment at more reasonable prices; and help with the marketing and distribution of products, etc.

Co-management with fishermen's organizations results in increased stewardship as well as greater responsibility and authority among the fishermen.

Knowledge of policy regulations

The Study shows that Jamaican fishermen **do not feel that they are involved in the decision-making process, with 26.6%** saying that they are consulted by the fisheries administration, as individuals or through associations. Furthermore, they show a **medium-high level of knowledge concerning the existence of national or regional strategies and management plans with a significant percentage of them (93%) being familiar with laws and regulations** related to their sector.

Environmental considerations

Sustainable development and exploitation of fishing resources can only be guaranteed through deep scientific knowledge of the marine ecosystem and biodiversity of the country, social awareness and systemic environmental control and monitoring.

Directives for improving good environmental practices, protection of rare species caught and marketing levels are crucial for the sustainability of resources.

From the results of the Study, it can be said that **Jamaican fishermen are aware of the necessity of conserving the resources: 93% of fishermen have observed a reduction in catches** in the recent years, and 83% indicate that have observed a reduction in size of species caught. Jamaican fishermen mainly attribute this reduction in catches and size to **natural disasters, climate change; deterioration of habitats; overfishing; illegal fishing;** and to a lesser extent to **industrial, urban and seashore pollution.** The decline in catches and the need to change target species are the main reasons why **81% of Jamaican fishermen have to change fishing grounds up to four times a year.**

The Study reveals that **Jamaican fishermen are also aware of the importance of marine protected areas** and think that they have a positive impact on fishing. Over 85% of Jamaican fishermen interviewed are **in favour of creating new marine protected areas**.

Main concerns of the sector

Being aware of the needs and concerns of the sector is fundamental in establishing political and social action to strengthen fisheries and fishery sector livelihoods.

The results of the study show that Jamaican fishermen's main concerns are those related to the need to **seek new fishing grounds; regarding infrastructures for unloading; illegal fishing; constraints in meeting supply and maintenance needs; price of fuel; lack of financial assistance; piracy and vandalism**. Regarding issues related to **marketing**, Jamaican fishermen seem concerned mainly with **low demand of fishing products, insufficient markets** and to a lesser extent with **low price of fish and lack of handling and preservation facilities and consumers' lack of purchasing power**.

Description of the processing sector households surveyed

The processing sector in Jamaica is mainly composed of **businesses that have been running more than ten years**. The analysis of the results indicates that the same proportion of men and women was surveyed. All women were between 26 and 35 years of age while men's ages ranged from 26 to 65. Processing sector **households are composed on average of 3.4 persons**.

Finance, investments and business growth expectations

A well developed and profitable processing sector is critical to the economy of a country as it economically **adds value to fishery products**, and is **a source of employment**, especially for **women and individuals with low skill profiles**.

In Jamaica, the processing industry appears to be financed mainly by national bank loans and to a lesser extent by personal savings and partnerships. 80% of the companies surveyed intend to continue working in the future and also intend to continue investing in modernization of the company.

As mentioned before, the general trend of those interviewed is the **interest in installing cold room units to increase storage capacity; diversifying to jewellery handicrafts using conch shell or installing flake ice machines**.

All businesses participating in this Study seem to provide **training courses** to their workers. The main courses are related to **food handling, hygiene and Hazard Analysis Critical Control Points (HACCP)**.

Productivity and profitability

Only 40% of the businesses **operate at full capacity**, and **none** are able to **supply their products throughout the whole year**.

Processing and **freezing of spiny lobster and queen conch** is the basis of fishery products processing plants. The lobster and the conch are frozen, prepared or vacuum-packed. The processing of various types of snappers and parrotfishes is also important. **Packaging and Distribution** activities are carried out in a large proportion of processing businesses.

Raw material is purchased directly from local fishermen and boats that work for the factory and from designated local fishermen. Raw material can also be purchased from fishermen from other communities, or can be imported. With regard to the marketing of processed products, they are **mainly exported either at a regional or international level, with sales also in the local and national market**. There seems to be quite a considerable international export market for fishery products belonging to the category of non-human consumption. The **main regional exports are directed to the French Antilles, USA and China**.

Revenues are based exclusively on sales. As for expenses, they focus on payment for raw materials (63.22%); staff salaries (20.6%); and to a lesser extent to pay for supplies such as fuel, electricity or gas; paying the amortization of tangible fixed assets and transport.

Employment and Security systems

In terms of the personnel who work in businesses related to the processing industry, in general, most of the Jamaican full-time workers are men. It is noteworthy that most women occupy technical positions or with some responsibilities. Women working in terms of seasonality occupy less skilled positions.

In Jamaica, **all companies are involved in the social security systems but only 40% are covered by some form of insurance**. In terms of financial assistance, **none of the processing businesses in Jamaica claim to have received any kind of governmental subsidy** and only 20% of them have been assisted by non-governmental organizations.

Presence of cooperatives

Cooperatives are fully involved in the Jamaican processing sector, with all companies claiming to belong to a cooperative and to being satisfied with the services provided.

In Jamaica, cooperatives are involved in the **marketing** of processed products; in the **supply of raw material and energy, in warehousing and in education**.

As said before, **co-management results in increased stewardship as well as greater responsibility and authority among the processing companies**.

Knowledge of policy regulations

The Study shows that in Jamaica, members of the processing sector **do not feel involved in the decision-making process** as only 20% of them claim to be consulted by the administration during the planning processes. Nevertheless they show a **full level knowledge concerning laws and regulations** related to their sector.

Environmental considerations

As for the relationship of the Jamaican processing industry and the environment, a significant involvement **in wastewater treatment** has **not** been observed. **Only 20% of processing plants apply primary treatments to wastewater**. However **another 20% of companies resort to packaging waste management companies to manage their solid waste**, the rest use incineration and garbage dumps as other routes in the **management of solid waste**.

The main source of energy used in the processing industry is electricity, and to a lesser extent fuel oil is used. Shells and operculum are obtained as by-products.

In the Jamaican processing industry, hygiene and sanitary controls of raw materials are fully implemented.

Main concerns of the sector

Being aware of the needs and concerns of the sector is fundamental in establishing political and social action to strengthen processing sector livelihoods.

The results of the Study show that the Jamaican processing sector's **main concerns** are those related to the **difficulty in gaining access to loans and to marketing of products; difficulties in distribution and transport of the product; difficulties in finding specialized staff and difficulties in fulfilment of environmental requirements and gaining access to electricity.**

The Study also reveals that the main **development actions** for the processing sector demanded by the respondents are **promotion of investment in the processing industry; promotion of the consumption and market opportunities for processed products; implementation of HACCP and traceability systems; implementation of quality certificates, boosting of R+D+I and reduction of negative impacts on the environment.**

Description of the aquaculture sector households surveyed

Aquaculture in Jamaica may be described as a growing sector. In recent times production has increased by 50 percent. Most aquaculture occurs on the south central plains of St. Catherine, Clarendon and Kingston.

According to the results almost all of the aquaculture sector interviewees were men, with only 7.75% being women. The bulk of age distribution of the interviewees is between 36 and 65 years old, but all age

classes are represented. The aquaculture sector households are composed on average of 3.04 persons.

Finance, investments and business growth expectations

Aquaculture has been identified as a sector in the region that has considerable potential for improving social and economic conditions of rural and coastal people, whilst simultaneously contributing to regional and national economic growth, generating employment and earning foreign exchange.

In Jamaica aquaculture farms appear to be financed mainly by **personal savings** and to a lesser extent by **national bank loans; partnerships, governmental assistance, and foreign investments.**

65.7% of Jamaican aquaculture farms intend to continue working but only 24.7% plan to invest in facility improvements. Investments will focus on enlarging the facilities by building new ponds; investing in water recirculation systems and the purchase of fish.

The Aquaculture Branch of Jamaica's Fisheries Division provides annual training seminars geared towards food fish farmers and ornamental fish farmers. This Study reveals that staff training is not an extended practice in Jamaican aquaculture farms. **However, this Study reveals that only 25.7% of interviewees claim to have received training courses.** Main courses focus on fish husbandry and farming techniques; fish handling; pond management and water quality, aeration and recirculation.

Training should be promoted. Having trained staff means not only improving product quality, but also involves development of human capacity and improvement of worker safety.

Activity

Based on the results of the study, in Jamaica, aquaculture is organized into **subsistence (30.43%) small-scale (42.61%)**, medium-scale (16.52%) and large-scale (10.43%) producers. Extensive (3.48%), **semi-intensive (81.74%)** and intensive (14.78%) production systems are practiced. **Freshwater** is the main type of activity carried out, but mariculture (2.61%) and brackish water (1.74%) cultures were reported.

In general terms, farming facilities in Jamaica are oriented to production and to a lesser extent to ornamental fish culture (22%) and restocking (1.96%).

The aquaculture sector in Jamaica is currently dominated by the culture of **tilapia**; most of its production is accounted for by Aquaculture Jamaica Limited, a subsidiary of the Jamaica Broilers Group. **Carps** such as *Cyprinus carpio* and **ornamental fishes** are also cultivated.

Productivity and profitability

Only 32% of farms **work at half their capacity, and only 21% are able to supply products throughout the year**. The main destination of the production is **national market though international exports, restocking and personal consumption are also important**. The major part of fish production is sold to wholesalers though direct sales to retailers and consumers also exist.

Revenues are based on sales and other unspecified types of income. As for expenses, they focus on payment of food (41.5%) the purchase of eggs and young fishes (22%); and to a lesser extent on paying salaries, water and other supplies, mortgage and rentals.

Employment and Security systems

In Jamaican aquaculture farms a major part of full-time and part-time workers are semi-skilled or unskilled workers. Women only occupy this type of jobs while men also occupy different skilled types of jobs. Most staff members are men.

Based on the Study only **10.7% of salaried staff seems to be involved in the social security systems** and only 1.74% of facilities are **covered by some form of insurance**. In terms of financial assistance only 7% of farms have received any government subsidy and 2.7% have received financial support by non-governmental organizations.

Participation in a social security system should be promoted among the members of the aquaculture sector so that they can benefit from short-term and long-term social benefits.

The production of value-added products should also be encouraged through the provision of appropriate incentives.

Presence of cooperatives

Only 25.2% of interviewees declare to belong to a cooperative, but they are satisfied with the services provided.

In Jamaica, cooperatives are mainly involved in **education** but also contribute to the **marketing of processed products; to the supply of fingerlings, food and other materials.**

Co-management is a power- and cost-sharing partnership that capitalizes on the knowledge and capacities of user groups and the government to create more legitimate, sustainable, equitable, and effective management systems.

Knowledge of policy regulations

The Study shows that members of the Jamaican processing sector **do not feel involved in the decision making process** as 66% of them are never consulted by the administration when designing planning processes. They also show a **low level knowledge concerning the existence of laws and regulations** related to their sector.

Environmental considerations

As for the relationship of the Jamaican aquaculture industry and the environment, a **low involvement in wastewater treatment, only 7.41% of farms; and in water recirculation, only 10.9% of farms**, has been observed. The main sources of water are irrigation systems; the national supply system and river water; water from the sea, rain or wells are also used. **Aeration systems are used in 37% of farms while filters are used in 70.6% of farms.**

Jamaican farms consider that feeding; quality of the water supply source and of the water in the facility; and plant location, are key environmental aspects for operating a farm.

Main concerns of the sector

Being aware of the needs and concerns of the sector is fundamental in establishing political and social action to strengthen processing sector livelihoods.

The results of the Study show that **the main concerns** of the Jamaican aquaculture sector are related to **obtaining supplies (food, young fish, generators...); low quality of water; difficulties in distribution and transport of products; fulfilment of environmental requirements and difficulties in gaining access to market of the products.**

The study also reveals that the main **development actions** for the aquaculture sector demanded by the respondents are **the promotion and investment in aquaculture; improvements in health control and product quality and boosting Research, Development and Innovation (R+D+I), promoting marketing opportunities for aquaculture products; promoting producer's organizations and speeding up of administrative procedures.**

Recommendations

This is a brief review of some of the recommendations proposed in Section V of this report and in the Policy Document. For a more in-depth explanation it is recommended to use them.

- √ Policy processes should be improved by:
 - conducting regular reviews and analysis of policies.
 - Encouraging co-management.
- √ A Fishermen's Pension and Social Security Benefit Scheme should be established within a legal framework.
- √ Social measures to help the poorer households to meet the basic needs should also be established.
- √ A financial support plan should be developed and introduced, in strong collaboration with related financial agencies and governments, to provide fisherfolk and fishers' organizations with access to credit for investment in responsible fishing gear and technologies, safety gear and safer practices. The financial plan should include micro-finance schemes.
- √ Training programs should be continued.
- √ Sector awareness on relevant issues that directly affect its activity, such as resource protection/conservation, the need for team management, participation in decision-making process, etc, must be promoted.
- √ Fishery products market structure must be improved. Docks, markets, refrigerated storage and processing areas need building or renovating.
- √ Distribution must be improved by extending distribution channels allowing fish to reach as many inland areas as possible in the best condition.
- √ Measures designed to reduce post-capture loss should be reinforced.
- √ A regular supply of fish to facilitate the organization of the market should be ensured.
- √ The administration in charge of managing fisheries should aim: to monitor fishing effort and enforce fishing regulations (MCS); to monitor fish stocks and advice on appropriate levels of exploitation of major commercial stocks; to report on the volume and value of production in the sector; to inform and instruct fishers on new technology through extension services. Fighting against IUU fishing and vandalism is key.
- √ Participation of women in the three sectors studied should be encouraged.
- √ Participation of the youth in the three sectors studied should be encouraged.
- √ Good environmental practices must be promoted among the three sectors studied.
- √ Promotion of the creation of marine protected areas.
- √ Conduct a study to determine the aquaculture potential of the country.
- √ Productivity of aquaculture farms might be enhanced, by carrying out projects to improve the production conditions of the growth units which are in operation, by improving the management of infrastructure, the acquisition of fishing equipment, building structures for fish manipulation and storage, etc. It will

also assess the technological needs of energy supply and technology for the cultivation among others, and it will

boost its acquisition, operation and maintenance.

Main Findings of the Diagnostic Study to Determine the Levels of Poverty in Fishing Communities in Selected CARICOM Countries:



MONTSERRAT

Key facts⁵⁰

Population 2011 *	5,140
Direct and indirect jobs in fisheries sector	76
GDP Total 2010***	US\$43m
Services **	76%
Industry **	23%
Agriculture **	1%
GDP by Sector	
Fisheries sector ***	0.01%

The sample studied

Household surveys were conducted in the west and northwest part of the island, where the fishery industry is developed. Chart 27 shows the number of surveys conducted in each area studied. In this study only households from the **extractive fishing sector** had participated.

Montserrat area surveyed	Aquaculture	Fisherman	Processing	Total
Carr's/Little Bay	-	32	-	32
Ilse Bay	-	6	-	6
Bunkum Bay	-	3	-	3
Total general	-	41	-	41

Chart 27 Completed questionnaires by sector and area sampled in Montserrat

Main Findings of the Study

The extent of poverty in Montserrat's fishery sector households

In the data analysis no poor households were detected but **7.5% of vulnerable households** were observed in **Carr's / Little Bay**. All households surveyed in the remaining regions have all their basic needs met. (Chart 28)

Montserrat Region	Not Poor	Vulnerable	Poor	% Responses per Region
Bunkum Bay	5%	0%	0%	5%
Ilse Bay	15%	0%	0%	15%
Carr's/Little Bay	72.50%	7.50%	0%	80%
MONTSERRAT	92.50%	7.50%	0%	100%

Chart 28 Extent of poverty in households of the fisheries sector in Montserrat.

The main constraints of vulnerable households are related mainly to **access to services** and to a lesser extent to **economic capacity**.

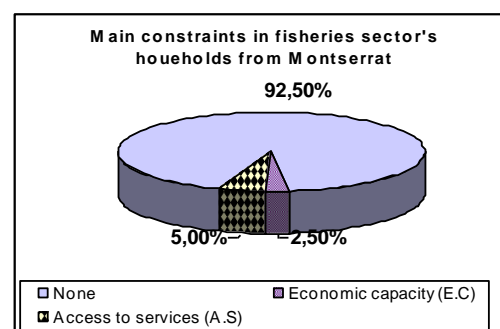


Chart 29 Main constraints. Montserrat

Chart 30 disaggregates by area the vulnerabilities detected in the data analysis. **Special attention should be given to these regions and their needs.**

Montserrat Region	Constraints	Condition of household	Sector
Carr's/Little Bay	Access to services Economic capacity	vulnerable	Extractive fishing

Chart 30 Main constraints by district. Montserrat

Living conditions and access to services
In general, dwellings in Montserrat **are undivided private houses owned by their occupants. They are built with bricks; wood or cement blocks and roofed with sheets of metal.**

⁵⁰ * CIA Factbook; ** Caribbean Flooring Council 2009 *** National fisheries officers 2010

In general, households have an optimum **access to services**. However 4.88% and 2.44% of households, identified as **vulnerable households from Carr's Little Bay**, do not have direct access (at the household level) to **running water; toilet and kitchen facilities; electricity; or drainage system**.

Concerning ownership of durable goods, a significant percentage of **households cannot afford to have motor vehicles (26.3%), washing machine (30%) or a fridge (7%)**.

The Interviewees' main concerns related to their **neighbourhood needs** are **asphalting of roadways** (33% of interviewees); the need to strengthen the **drainage network (33%)**, **electricity (11%)** and new **health centres (11%)**. Chart 31 shows the main neighbourhoods' needs by region identified in this Study. All districts surveyed, to a greater or a lesser extent, seem to have the same needs.

Montserrat Region	Neighbourhood needs
Carr's/Little Bay	Electricity; Health centre; Drainage network; Asphalting
Bunkum Bay	Drainage network

Chart 31 Neighbourhoods' main needs. Montserrat

Education

In general terms, family members of the fisheries sector have received primary or secondary education regardless of their gender. Tertiary education is represented by 5% of the individuals studied. No cases of Illiteracy or semi-literacy have been detected.

Economic capacity

Montserrat's households are the ones with the **highest dependency on their fishery income**. Although all fisheries sector households' sources of income are from

fishing, the **economic dependency** of these families is not very high. The low number of household members in Montserrat is the main reason for this.

Description of the extractive fishing sector households surveyed

According to the results **93.18%** of the fishermen interviewed were **men**. In this profession, the age distribution appears to be concentrated among those aged between 36 and 65 years. Those aged between 56 and 65 years represent 34.09% of those interviewed. This Study reveals **in Montserrat a low participation in the sector of individuals under 36 years old and the highest participation of active fishermen aged over 65 years**.

Fishermen's **households are composed on average of 1.93 persons**, 57.48% men and 42.52% women. The results of this Study indicate that **Montserrat is one of the countries with the highest aging population of the region**.

Economic importance of fishing

Fishing is an important activity that contributes to household livelihood, but households with more than one source of income are more stable economically speaking. Households belonging to the fishing sector in Montserrat do not receive financial contributions from other sectors (Montserrat's households **Importance of fishing within the Families Index 100%**), but the low percentage of young household members and members per household results in a relatively **low Economic Dependency Index**; each employed household member must financially support 1.55 unemployed household members.

Fishing makes an **economic contribution at the local level** by providing direct impacts related to sales as well as indirect impacts "upstream" and "downstream"

through the commodity/supply chain. **In Montserrat about 53.22% of each boat's costs are used in paying for fuel, 24.77% for bait; 7.25% for oil; 5.9% for ice; and only 3.5% for crew wages. The rest is spent on paying for the maintenance of boat and gear.**

Activity

According to the results of the Study, members of the extractive fishing sector in Montserrat are not only engaged in the **harvesting process**, they are also responsible **for marketing and gear and vessel construction and repair.**

Productivity and profitability

Montserrat appears among the 4 countries with most basic needs met, however the sector fishing efficiency analysis shows that **Montserrat is one of the two least productive countries.** In Montserrat vessels are engaged in artisanal fishing **experiencing low profitability, both in volume of catches as well as economic earnings.**

In a country where fishermen declare their total dependence on fishing, the fishing capacity of vessels should be important to make the sector's activity profitable.

A significant interest in investing in fleet modernization has been observed. 97.5% of respondents claimed to have spent money from their savings in the last 5 years on the purchase of gear, equipment and boats. 87.5% of respondents claim that they will invest in the next 5 years in improving their fishery activities. **Buying new boats, gear and equipment continue to be the main objectives of fishermen.** To do this, fishermen will mainly make use of their own savings. **25% of fishermen** interviewed had at some time received **a loan** for their income-generating fisheries activities. Only 20%

of fishermen interviewed claim to have access to loans.

Training and skills

Taking into account the results of the study, in Montserrat, only a 22% of respondents have received fishery training.

This low figure indicates that **fishery training should be enhanced.** Training should not only be oriented to improve quality of fishing products, it should also be conducted to guarantee the crew's safety and to improve fishing efficiency. In addition, it can be used to open up new avenues of income if it is decided to invest in processing and marketing.

Security systems

In Montserrat only 29% of fishermen interviewed said that they were participating in a social security system, with only 12.2% claiming to have received a government subsidy in the last 5 years, and 17% to have received some form of non-governmental financial assistance.

Participation in a social security system should be promoted among the members of extractive fishing sector in order for them to receive both short-term and long-term social benefits.

Presence of cooperatives

According to this Study it would appear that **cooperatives** are not extensive in Montserrat, with **29.27% of respondents claiming to belong** to one and 43% of respondents not believing in their proper functioning.

Enhancing the role of cooperatives is recommended as it constitutes a type of co-management in which government and users cooperate together as equal partners in the decision-making process. Cooperatives can also provide legal

advice; credits or financial assistance; training; gear and equipment at more reasonable prices; can help with the marketing and distribution of products, etc.

Co-management with fishermen's organizations results in increased stewardship as well as greater responsibility and authority among the fishermen.

Knowledge of policy regulations

The Study shows that Montserrat's fishermen **do not feel that they are involved in the decision-making process, with only 19%** saying that they are consulted by the fisheries administration, as individuals or through associations. Furthermore, they show a **low level of knowledge concerning the existence of national or regional strategies and management plans**. Nevertheless **a large percentage** of them (78%) were **familiar with laws and regulations** related to their sector.

Environmental considerations

Sustainable development and exploitation of fishing resources can only be guaranteed through deep scientific knowledge of the marine ecosystem and biodiversity of the country, social awareness and systemic environmental control and monitoring.

Directives for improving good environmental practices, protection of rare species caught and marketing level are crucial for the sustainability of resources.

From the results of the Study, it can be said that **fishermen have only a medium awareness of the necessity of conserving the resources**, though 82% of fishermen have observed a reduction in catches in the recent years. 26.8% of them are not in favour of creating more protected areas in

their country, and 34% do not care whether they are created or not. Only 26.8% of interviewees think that they have a positive impact on fishing. **Given these results, it is important to find out the reason for this way of thinking and see if created protected areas are well planned and implemented and how they affect fishermen's activity. If the objectives are being met, then the fishermen should be informed of the importance of protected areas in fisheries.**

The need to change target species and the decline in catches are the main reasons why **80% of Montserrat's fishermen have to change fishing grounds up to four times a year.**

Main concerns of the sector

Being aware of the needs and concerns of the sector is fundamental in establishing political and social action to strengthen fisheries and fisheries sector livelihoods.

The results of the Study show that in Montserrat, fishermen's main concerns are those related to the need to **seek new fishing grounds; regarding infrastructures to unloading; constraints in meeting supply and maintenance needs and finding a crew; and piracy of gear (traps)**. Regarding **issues related to marketing**, Montserrat's fishermen seem concerned mainly with **insufficient markets and handling and preservation facilities** and to a lesser extent with **low demand for products; low price of fish for their fishery products and consumers' lack of purchasing power.**

Recommendations

This is a brief review of some of the recommendations proposed in Section V of this report and in the Policy Document. For a more in-depth explanation it is recommended to use them.

- √ Policy processes should be improved by:
 - conducting regular reviews and analysis of policies.
 - Encouraging co-management.
- √ A Fishermen's Pension and Social Security Benefit Scheme should be established within a legal framework;
- √ Social measures to help the poorer households to meet the basic needs should also be established.
- √ A financial support plan should be developed and introduced, in strong collaboration with related financial agencies and governments, to provide fisherfolk and fishers' organizations with access to credit for investment in responsible fishing gear and technologies, safety gear and safer practices. The financial plan should include micro-finance schemes.
- √ Training programs should be continued.
- √ Sector awareness on relevant issues that directly affect its activity, such as resource protection / conservation, the need for team management, participation in decision-making process, etc, must be promoted.
- √ Fishery products market structure must be improved. Docks, markets, refrigerated storage and processing areas need building or renovating.
- √ Distribution must be improved by extending distribution channels allowing fish to reach as many communities as possible in the best condition.
- √ Measures designed to reduce post-capture loss should be reinforced.
- √ A Regular supply of fish to facilitate the organization of the market should be ensured.
- √ The administration in charge of managing fisheries should aim: to monitor fishing effort and enforce fishing regulations (MCS); to monitor fish stocks and advice on appropriate levels of exploitation of major commercial stocks; to report on the volume and value of production in the sector; to inform and instruct fishers on new technology through extension services. Fight against IUU fishing and vandalism is key.
- √ Participation of women in the three sectors studied should be encouraged.
- √ Participation of the youth in the three sectors studied should be encouraged.
- √ Good environmental practices must be promoted among the three sectors studied.
- √ Promotion of the creation of marine protected areas should be continued.
- √ Conduct a study to determine the aquaculture potential of the country.

Main Findings of the Diagnostic Study to Determine the Levels of Poverty in Fishing

Communities in Selected CARICOM Countries:



SAINT KITTS & NEVIS

Key facts⁵¹

Population 2011 *	50,314
Net primary enrolment **	93%
Direct and indirect jobs in fisheries sector	600
Services **	77%
GDP by Sector 2009	
Industry **	20%
Agriculture **	2%
Fisheries sector ***	2.39%

The sample studied

Household surveys were conducted in both islands; with Saint George on Saint Kitts island; and Saint James and Saint Thomas on Nevis being the parishes in which the highest numbers of interviews were conducted.

Chart 32 shows the number of surveys conducted in each parish studied.

St Kitts and Nevis parishes	Aquaculture	Fishermen	Processing	Total
St. George	-	12	1	13
St. Peter's	1	6	-	7
St. Thomas	-	11	-	11
St. James	-	16	1	17
St. Pauls	-	6	2	8
St Mary/St. John	-	7	-	7
St. Anne's	-	6	-	6
St. Thomas/Trinity	-	2	-	2
Total general	1	66	4	71

Chart 32 Completed questionnaires by sector and districts sampled in St. Kitts and Nevis

Main Findings of the Study

The extent of poverty in households of the fisheries sector in St. Kitts & Nevis

In the data analysis no poor households were detected but **9.86% of vulnerable households** were observed distributed through St. James, St. Anne's, St. Thomas, St. Mary, and St. Pauls. All households

surveyed in the remaining regions have all their basic needs met. (Chart 33)

St Kitts and Nevis Region	Not Poor	Vulnerable	Poor	% Responses per Region
St. Peter's	9.86%	0%	0%	9.86%
St. Thomas/Trinity	2.82%	0%	0%	2.82%
St. George	18.31%	0%	0%	18.31%
St. James	22.54%	1.40%	0%	23.94%
St. Anne's	7.04%	1.41%	0%	8.45%
St. Thomas	14.08%	1.41%	0%	15.49%
St. Mary/St John	7.04%	2.82%	0%	9.86%
St. Pauls	8.45%	2.82%	0%	11.27%
SAINT KITTS AND NEVIS	90.14%	9.86%	0%	100%

Chart 33 Extent of poverty in households of the fisheries sector in St. Kitts and Nevis.

The main constraints of vulnerable households are related mainly to **education; access to services and economic capacity.**

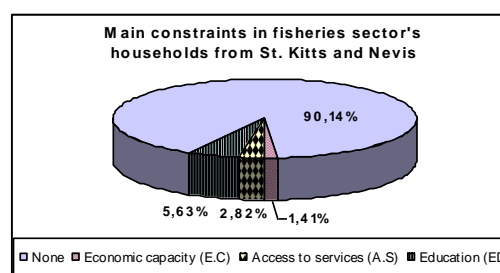


Chart 34 main constraints in fisheries sector's households from St. Kitts and Nevis.

Chart 35⁵² disaggregates by parish the vulnerabilities detected in the data analysis. Special attention should be given to these regions and their needs.

⁵¹ * CIA Factbook; *** National fisheries officers 2010

⁵² UBN stands for Unsatisfied Basic Needs, DQ for dwelling quality, EcC for economic capacity, ED for education, A.S for access to services. P.S stands for processing sector; E.F.S for extractive fishing sector and Aq. S for aquaculture sector

St Kitts and Nevis surveyed parishes	Constraints	Condition of household	Sector
St. Thomas	Access to services	vulnerable	Extractive fishing
St. James	Education	vulnerable	Extractive fishing
St. Pauls	Education	vulnerable	P.S; E.F.S
St Mary/St. John	Ec C; ED	vulnerable	Extractive fishing
St. Anne's	Access to services	vulnerable	Extractive fishing

Chart 35 Main constraints by district. St. Kitts and Nevis

Living conditions and access to services

In general, St. Kitts and Nevis dwellings are undivided private houses. They are built with solid materials and they have an optimum access to services. However some non poor households of St. Anne's, less than 1.41% of all households surveyed, have reported the absence of toilet or shower in their household and community.

Concerning ownership of durable goods, households can afford to have almost all durable goods described in this study, motor vehicles and washing machines being the only material possessions that respectively 18.84% and 15.94% of households could not afford.

The interviewees' main concerns related to their neighbourhood needs are the **asphalting of roadways** (35.79% of interviewees); the need to strengthen the **drainage network** (37.89%), **new health centres** (5.26%) and **rubbish collection** (4.21%). (Chart 36).

St Kitts and Nevis parish surveyed	Neighbourhood needs
St Mary/St. John	Garbage dump; Drainage network; Asphalting
St. Anne's	Water-treatment plant; Gas; Asphalting; Rubbish collection
St. George	Public school; Health centre; Drainage network; Asphalting
St. James	Health centre; Drainage network; Asphalting; Rubbish collection
St. Pauls	Gas; Drainage network; Asphalting
St. Peter's	Garbage dump; Asphalting
St. Thomas	Public school; Health centre; Drainage network; Asphalting
St. Thomas/Trinity	Electricity; Asphalting; Rubbish collection

Chart 36 St. Kitts and Nevis neighbourhoods' main needs

Education

In general terms, the family members of the fisheries sector in St. Kitts and Nevis have received secondary or primary education regardless of their gender. Illiteracy and semi-literacy have been observed in 2.19% of individuals studied. Tertiary education is represented by 14.75% of the individuals studied.

Economic capacity

St. Kitts and Nevis households do not have a high dependency on fisheries income. Only some vulnerable households from St Mary/ St John do not have enough earnings to reach the US\$ 1,500 per year to cover the necessities of each household member.

Description of the extractive fishing sector households surveyed.

According to the results, **94.03% of the fishermen** interviewed in St. Kitts and Nevis were **men**. In this profession, the age distribution seems to be concentrated among those aged between 26 and 55 years old. Fishermen over 55 years are also representative (8.96%). This Study reveals in St. Kitts and Nevis a low participation in the sector of individuals under 26 years old and a high participation of individuals over 36 years.

Fishermen's households are composed on average of **2.58 persons**, 54.71% men and 45.29% women. The results of this study indicate that **St. Kitts and Nevis is the country with the highest aged population of the region.**

Economic importance of fishing

Fishing is an important activity that contributes to household livelihood, but households with more than one source of income are more stable economically

speaking. Households belonging to the fishing sector in St. Kitts receive financial contributions from other sectors such as services; tourism; the state etc. (St. Kitts and Nevis' households **Importance of fishing within the Families Index 81.77%**). In addition, a relatively low unemployment rate results in a relatively **low Economic Dependency Index**; each employed household member must financially support 1.63 unemployed household members.

Fishing also contributes to household economy in terms of **food security** through consumption of the household's catch. According to FAOstat, in St. Kitts and Nevis each individual consumes about 31.38 kilos per year of fishery products, well above the world average (16.7) (FAOstat 2007).

Fishing makes an **economic contribution at the local level** by providing direct impacts related to sales as well as indirect impacts "upstream" and "downstream" through the commodity/supply chain. **In St. Kitts and Nevis about 54.21% of each boat's costs are used in paying fuel; 22.10% in crew's wages; 8.8% in paying for oil; 7.23% paying for the bait; and the rest is spent on paying for ice, licences, insurance and the maintenance of boat and gear.**

Activity

According to the results of the Study, members of the extractive fishing sector in St. Kitts and Nevis not only are engaged in **harvesting**, but they are also responsible for the **marketing. Processing** fisheries products and **gear and vessel construction and repair** are activities carried out **to a lesser extent**.

Productivity and profitability

St. Kitts and Nevis' vessels have **a low physical and power productivity**.

Despite the low total weight of catches of these vessels, the quite high price that they reach in the market makes these ships medium economically productive.

A significant interest in investing in fleet modernization has been observed. 85.48% of respondents claimed to have spent money from their savings in the last 5 years in purchase of gear and boat improvements. 80.65% of respondents claim that they will invest in the next 5 years in improving their fisheries activities. **Buying new boats and gear are the main objectives of fishermen.** To do this, fishermen will make use of their own savings or will request a loan. **45.16% of fishermen** interviewed had at some time received **a loan** for their income-generating fisheries activities. Only 56.6% of fishermen interviewed claim to have access to loans.

Training and skills

Taking into account the results of the Study, in St. Kitts and Nevis, only 18.18% of respondents have received fishery training.

This low figure indicates that **fishery training should be enhanced**. Training should not only be oriented to improving the quality of fishery products, it should also be conducted to guarantee the crew's safety and to improve fishing efficiency. In addition, it can be used to open up new avenues of income if it is decided to invest in processing and marketing.

Security systems

Compared to the rest of the countries studied, it seems that in St. Kitts and Nevis fishermen's participation in the social security system is **widespread** (57.58% of fishermen interviewed in the country); however few cases of fishermen who have received any government subsidy (only

18.18%) or non-governmental funding (25.76%) were found.

Continuing to promote membership in social security systems is crucial to increase the percentage of fishermen receiving both short-term and long-term social benefits.

Presence of cooperatives

According to this Study it would appear that **cooperatives** are extensive in St. Kitts and Nevis, with **40.9% of respondents claiming to belong** to one. However, the degree of satisfaction with their functioning is not complete.

Enhancing the role of cooperatives is recommended as it constitutes a type of co-management in which government and users cooperate together as equal partners in the decision-making process. Cooperatives can also provide legal advice; credit or financial assistance; training; gear and equipment at more reasonable prices; and help with the marketing and distribution of products, etc.

Co-management with fishermen's organizations results in increased stewardship as well as greater responsibility and authority among the fishermen.

Knowledge of policy regulations

The Study shows that St. Kitts and Nevis fishermen **feel quite involved in the decision-making process**; with **44.55%** saying that they are consulted by the fisheries administration, as individuals or through associations. They show a **low level of knowledge concerning the existence of national or regional strategies and management plans but a large percentage** of them (83.33%) are **familiar with laws and regulations** related to their sector.

Environmental considerations

Sustainable development and exploitation of fishing resources can only be guaranteed through deep scientific knowledge of the marine ecosystem and biodiversity of the country, social awareness and systemic environmental control and monitoring.

Directives for improving good environmental practices, protection of rare species caught and marketing level are crucial for the sustainability of resources.

From the results of the Study, it can be said that **St. Kitts and Nevis' fishermen are aware of the necessity of conserving the resources, 88% of fishermen have observed a reduction in catches** in recent years, and 74% indicate that they have observed a reduction in the size of species caught. Fishermen mainly attribute this reduction in catches and size to **climate change, natural disasters, climate and deterioration of habitats**; and to a lesser extent to **industrial pollution and overfishing**.

The decline in catches, the need to change target species and avoiding overfishing fishing grounds are the main reasons why **all fishermen have to change fishing grounds up to four times a year**.

The Study reveals that **St. Kitts and Nevis' fishermen are also aware of the importance of marine protected areas** and think that they have a positive impact on fishing. Over 68% of fishermen interviewed are **in favour of creating new marine protected areas**.

Main concerns of the sector

Being aware of the needs and concerns of the sector is fundamental in establishing political and social action to strengthen fisheries and fisheries sector livelihoods.

The results of the Study show that St. Kitts and Nevis fishermen' main concerns are those related to the need to **seek new fishing grounds; and problems regarding infrastructures for unloading; dealing with consequences of hurricanes and storms; need to replace fishing gears, alteration and destruction of the environment, lack of financial assistance; problems meeting supply and maintenance needs; problems regarding recreational fishermen; price of fuel; lack of financial assistance; piracy and vandalism.** Regarding issues related to **marketing** St. Kitts and Nevis' fishermen seem concerned mainly with **insufficient markets** and to a lesser extent with **low demand of fishing products** and **lack of handling and preservation facilities.**

Description of the processing sector households surveyed

The processing sector in St. Kitts and Nevis is mainly composed of **businesses that have been running more than ten years.** The analysis of the results indicates that the same proportion of men and women was surveyed. All women were between 15 and 35 years of age while men's ages ranged from 46 to 55. Processing sector **households are composed on average of 3 persons.**

Finance, investments and business growth expectations

A well developed and profitable processing sector is critical to the economy of a country as it economically **adds value to fisheries products, and is a source of employment, especially for women and individuals with low skill profiles.**

In St. Kitts and Nevis, the processing industry appears to be financed mainly by national bank loans and to a lesser extent by personal savings and government assistance. All companies surveyed intend to continue working in the future and also

intend to continue investing in the modernization of the company.

As mentioned before, the general trend of those interviewed is **the interest in installing cold room units and vacuum pack machines.**

Half of the businesses participating in this study seem to provide **training courses** to their workers. The main courses are related to **improving processing techniques.**

Productivity and profitability

Though all businesses are able to **supply their products throughout the whole year,** only 25% of them **operate at full capacity.**

The processing (frozen and fresh or refrigerated prepared fish) of dolphinfish, hinds, parrotfish, snappers and large pelagic species such as king mackerel or wahoo is the basis of fishery product processing plants, though the processing of spiny lobster and queen conch is also significant. **Distribution and packaging** activities are also carried out in a large proportion of processing businesses.

Raw material is purchased directly from local fishermen and boats that work for the factory and from designated local fishermen. Raw material can also be purchased from fishermen of other communities. With regard to the **marketing** of processed products, they are **mainly sold in the local and national markets** but there are also **some exports** at the regional level to the **French Antilles.** Revenues are based exclusively on sales. As for expenses, they focus on payment for raw materials (79.25%); staff salaries (12.59%); and to a lesser extent on payment of supplies such as fuel, electricity or gas; and payment of rentals and the National Social Security contribution.

Employment and Security systems

The processing industry in Saint Kitts and Nevis employs more women than men, but while all men occupy skilled jobs, almost all women hold low-skilled jobs.

In St. Kitts and Nevis, **all companies are involved in the social security systems but only 33.33% are covered by some form of insurance.** In terms of financial assistance, a significant participation of governmental and non-governmental assistance is observed. **50% of the processing businesses claim to have received some form of government subsidy and 75% of them have been assisted by non-governmental organizations.**

Presence of cooperatives

Cooperatives are partially involved in the St. Kitts and Nevis' processing sector, but they are not fully supported. 50% of companies claim to belong to a cooperative but none of the interviewees are satisfied with the services provided.

In St. Kitts and Nevis, cooperatives are involved in **marketing** of processed products and in the **supply of materials.**

As said before, **co-management results in increased stewardship as well as greater responsibility and authority among the processing companies.**

Knowledge of policy regulations

The Study shows that members of the St. Kitts and Nevis' processing sector **feel involved in the decision-making process** as 66% of them claim to be consulted by the administration during planning processes. Nevertheless they show a **low level knowledge concerning laws and regulations related to their sector.**

Environmental considerations

As for the relationship of the processing industry in St. Kitts and Nevis and the environment, **no involvement in wastewater and solid waste treatment was observed. Solid waste is disposed in the garbage dump or directly in the sea.**

Electricity is the source of energy used in the processing industry. No by-products are obtained.

In the St. Kitts and Nevis' processing industry, hygiene and sanitary controls of raw materials are not carried out.

Main concerns of the sector

Being aware of the needs and concerns of the sector is fundamental in establishing political and social action to strengthen processing sector livelihoods.

The results of the Study show that in St. Kitts and Nevis, the processing sector's **main concerns** are those related to **the difficulty in finding specialized staff; in fulfilment of environmental requirements; in distribution and transport of products; and those caused by natural disasters.**

The Study also reveals that the main **development actions** for the processing sector demanded by the respondents are **promotion of the consumption and market opportunities for processed products; promotion of producers' organizations; development and transfer of technology; improvements in health control and product quality and implementation of HACCP and traceability systems.**

Description of the aquaculture sector households surveyed

Aquaculture is a fledgling sector in St. Kitts and Nevis. Only one aquaculture

farm, located in St. Peter has participated in the Study. This aquaculture plant works in **small scale** production.

Finance, investments and business growth expectations

Aquaculture has been identified as a sector in the region that has considerable potential for improving social and economic conditions of rural and coastal people, whilst simultaneously contributing to regional and national economic growth, generating employment and earning foreign exchange.

In St. Kitts and Nevis this aquaculture farm appears to be financed mainly by **personal savings**. The overall impression is that this **small-scale** farm intends to **continue growing**, and for that it is planned to invest money in building new ponds and in increasing the stock.

The farm provides its staff with training courses related to water quality; breeding and routine farm operations.

Activity

This fish farming facility is a **marine**⁵³ **water raceways farm exploited as a small scale intensive culture in which reproduction, hatchery, nursery and grow-out stages are carried out**. The only species cultivated is **tilapia**.

Productivity and profitability

The farm **works at 40% of its capacity but is able to supply products throughout the year**. The main destination of the production is the **local market**; fish is directly sold to the consumer without using intermediary

agents. Also 20% of production is used for **restocking** and 6% for **personal consumption**.

Revenues are based exclusively on sales. As for expenses, they focus on repair and maintenance activities (33.38%); purchase of fish food (23.84%); payment of the quality assurance system (15.12%) and payment of rentals, transport and water supplies.

Employment and Security systems

The tilapia farm has only one worker, a man working full-time and with professional worker category. Occasionally, the farm may also utilize the labour of volunteers / trainees.

Training courses are geared to the areas of the biology of water quality, spawning, and environmental growth rate.

This worker participates in the social security system, but the farm is not covered by any kind of insurance. In terms of financial assistance, the farm has only received financial support by non-governmental organizations; the government has not participated in its finance.

Presence of cooperatives

The owner of the farm does not belong to any cooperative or association and he is not in favour of its operating mode.

Knowledge of policy regulations

The Study shows that this small scale facility is **not involved in the decision-making process** though it is aware of **national or regional aquaculture development plan and of laws and regulations** related to its sector.

⁵³ From the data analysis was extracted that the existing farm in St. Kitts and Nevis was a brackish water aquaculture farm, but in validation workshop country's representative stated that the farm uses only sea water.

Environmental considerations

As for the relationship of the St. Kitts and Nevis' aquaculture industry and the environment, a high **involvement in wastewater treatment and in water recirculation** has been observed. The main source of water is sea water and aeration systems as well as filters are used.

The St. Kitts and Nevis' farm considers that quality of the water supply source and of the water in the facility; water use permits and farm's location are key environmental aspects for operating a farm.

Main concerns of the sector

Being aware of the needs and concerns of the sector is fundamental in establishing political and social action to strengthen processing sector's livelihoods.

The results of the Study show that the aquaculture sector's **main concerns** are related to **bureaucratic problems; difficulty in gaining access to electricity and other supplies; natural disasters; and difficulties in gaining access to loans and to the marketing of products.**

The Study also reveals that the main **development actions** for the aquaculture sector demanded by the respondents are **the improvement of health control and product quality; boosting Research, Development and Innovation (R+D+I); reduction of negative impacts on the environment; training of specialized technicians; speeding up the administrative procedures; promotion of consumption and marketing opportunities for aquaculture products; promotion of producer's organizations; locating of zones and possibilities for the development of aquaculture; development of transfer technology and distribution and transport of**

aquaculture products and the need to design and implement an action plan.

Recommendations

This is a brief review of some of the recommendations proposed in Section V of this report and in the Policy Document. For a more in-depth explanation it is recommended to use them.

- √ Policy processes should be improved by:
 - conducting regular reviews and analysis of policies.
 - Encouraging co-management.
- √ A Fishermen's Pension and Social Security Benefit Scheme should be established within a legal framework.
- √ Social measures to help the poorer households to meet the basic needs should also be established.
- √ A financial support plan should be developed and introduced, in strong collaboration with related financial agencies and governments, to provide fisherfolk and fishers' organizations with access to credit for investment in responsible fishing gear and technologies, safety gear and safer practices. The financial plan should include micro-finance schemes.
- √ Training programs should be continued.
- √ Sector awareness on relevant issues that directly affect its activity, such as resource protection/conservation, the need for team management, participation in decision-making process, etc, must be promoted.
- √ Fishery products market structure must be improved. Docks, markets, refrigerated storage and processing areas need building or renovating.
- √ Distribution must be improved by extending distribution channels allowing fish to reach as many communities as possible in the best condition.
- √ Measures designed to reduce post-capture loss should be reinforced.
- √ A Regular supply of fish to facilitate the organization of the market should be ensured.
- √ The administration in charge of managing fisheries should aim: to monitor fishing effort and enforce fishing regulations (MCS); to monitor fish stocks and advise on appropriate levels of exploitation of major commercial stocks; to report on the volume and value of production in the sector; to inform and instruct fishers on new technology through extension services. Fighting against IUU fishing and vandalism is key.
- √ Participation of women in the three sectors studied should be encouraged.
- √ Participation of the youth in the three sectors studied should be encouraged.
- √ Good environmental practices must be promoted among the three sectors studied.
- √ Promotion of Continue promoting the creation of marine protected areas should be continued.
- √ Conduct a study to determine the aquaculture potential of the country.
- √ Productivity of aquaculture farms might be enhanced, by carrying out projects to improve the production conditions of the growth units which are in operation, by improving the management of infrastructure, the acquisition of fishing equipment,

building structures for fish manipulation and storage, etc. It will also assess the technological needs of energy supply and technology for the

cultivation among others, and it will boost its acquisition, operation and maintenance.

Main Findings of the Diagnostic Study to Determine the Levels of Poverty in Fishing

Communities in Selected CARICOM Countries:



ST VINCENT & THE GRENADINES

Key facts⁵⁴

Population 2011 *	103,869
Net primary enrolment **	95%
Direct and indirect jobs in fisheries sector	3,000
Services **	70%
GDP by Sector 2009 Industry **	23%
Agriculture **	7%
Fisheries sector ***	0.78%

The extent of poverty in households of the fisheries sector in St. Vincent and the Grenadines

In the data analysis **5.41% of poor households** distributed over Owia; Fitz Hughes and Barrouallie parishes were detected. All poor households belong to the extractive fishing sector.

The sample studied

Household surveys were conducted in all parishes. Chart 37 shows the number of surveys conducted in each parish studied.

St Vincent and the Grenadines parishes	Aquaculture	Fisherman	Processing	Total
Kingstown	-	8	1	9
Clare Valley	-	3	-	3
Lowmans	-	2	-	2
Camden Park	-	3	-	3
Barrouallie	-	4	-	4
Layou	-	3	-	3
Union Island	-	4	2	6
Mayreau	-	3	-	3
Buccament	-	3	-	3
Bequia	-	4	-	4
Owia	-	4	-	4
Great Head Bay	-	3	-	3
Indian Bay	-	1	-	1
Questelles	-	3	-	3
Fancy	-	2	-	2
Fitz Hughes	-	6	-	6
Petir Bordel	-	3	-	3
Chateaubelair	-	3	-	3
Calliaqua	-	4	1	5
Sandy Bay	-	3	-	3
Canouan	-	3	-	3
Total general	-	72	4	76

Chart 37 Completed questionnaires by sector and districts sampled in St. Vincent and the Grenadines

Main Findings of the Study

10.81% of vulnerable households were also detected in six of the twenty-one parishes surveyed.

Vulnerable households belong to extractive fishing sector or to processing sector (Chart 38). It should be noted that none of the households studied in Barrouallie were considered not poor.

St Vincent and the Grenadines parishes	Non-poor	Vulnerable	Poor	% Responses per Region
Bequia	5.41%	0%	0%	5.41%
Buccament	4.05%	0%	0%	4.05%
Calliaqua	5.41%	0%	0%	5.41%
Camden Park	4.05%	0%	0%	4.05%
Canouan	4.05%	0%	0%	4.05%
Chateaubelair	4.05%	0%	0%	4.05%
Clare Valley	4.05%	0%	0%	4.05%
Fancy	2.70%	0%	0%	2.70%
Indian Bay	1.35%	0%	0%	1.35%
Lowmans	2.70%	0%	0%	2.70%
Mayreau	4.05%	0%	0%	4.05%
Petit Bordel	4.05%	0%	0%	4.05%
Questelles	4.05%	0%	0%	4.05%
Sandy Bay	4.05%	0%	0%	4.05%
Great Head Bay	2.70%	1.35%	0%	4.05%
Kingstown	10.81%	1.35%	0%	12.16%
Layou	2.70%	1.35%	0%	4.05%
Union Island	5.41%	1.35%	0%	6.76%
Owia	4.05%	0%	1.35%	5.41%
Barrouallie	0.00%	4.05%	1.35%	5.41%
Fitz Hughes	4.05%	1.35%	2.70%	8.11%
St Vincent and the Grenadines	83.78%	10.81%	5.41%	100%

Chart 38 Extent of poverty in households of the fisheries sector of St. Vincent and the Grenadines.

⁵⁴ * CIA Factbook; ** 2011 Commonwealth Yearbook; *** National fisheries officers 2010

The main constraints of vulnerable and poor households are related mainly to economic capacity and access to services.

Chart 39⁵⁵ disaggregates by parish the vulnerabilities detected in the data analysis. **Special attention should be given to these regions and their needs.**

St Vincent and the Grenadines surveyed parishes	Constraints	Condition of household	Sector
Kingstown	Economic capacity	Vulnerable	Extractive fishing
Barrouallie	A.S; Ec. C	Vulnerable and poor	Extractive fishing
Layou	Economic capacity	Vulnerable	Extractive fishing
Union Island	Economic capacity	Vulnerable and poor	Processing
Owia	D.Q; ED	Poor	Extractive fishing
Great Head Bay	Access to services	Vulnerable	Extractive fishing
Fitz Hughes	Ec. C; ED; D.Q	Vulnerable and poor	Extractive fishing

Chart 39 Main constraints by district. St. Vincent and the Grenadines

Living conditions and access to services

In general, St. Vincent and the Grenadines dwellings are **undivided private houses**. They are built with solid materials and have an **optimum access to services**. However, some vulnerable households from Barrouaille and Great Head Bay, less than 3.95% of all households surveyed, do not have direct access to running water, electricity and toilet facilities.

Concerning ownership of durable goods, a significant percentage of **households cannot afford motor vehicles (57.33%), washing machines (43.24%) or refrigerators (15%)**. Results show that with the exception of motor vehicles, the rest are desirable goods. What cannot be assured is if motor vehicles are not

desirable goods because people cannot afford them, or simply because they do not need them.

The interviewees main concerns related to their **neighbourhood needs** are the **asphalting of roadways** (31.4% of interviewees); the need to **strengthen the drainage network (15.12%)**, **health centres** (13.95%) and **public transport** (9.30%). Chart 40 shows the main neighbourhood's needs by parish identified in this study.

St Vincent and the Grenadines parish surveyed	Neighbourhood needs
Kingstown Barrouallie Union Island Buccament Great Head Bay	Drainage network; Asphalting
Lowmans Camden Park Petir Bordel Chateaubelair Indian Bay Questelles	Asphalting
Sandy Bay	Electricity; Asphalting
Clare Valley	Gas; Drainage network; Asphalting
Fancy	Water-treatment plant; Health centre; Asphalting
Fitz Hughes	Garbage dump; Asphalting; Rubbish collection
Bequia	Garbage dump; Gas; Water-treatment plant; Public transport; Health centre; Drainage network; Rubbish collection
Calliaqua	Public school; Water-treatment plant; Public transport; Health centre; Drainage network; Asphalting
Canouan	Public school; Water-treatment plant; Electricity; Public transport; Health centre; Drainage network; Asphalting
Owia	Water-treatment plant; Gas; Public transport; Health centre; Drainage network

Chart 40 Saint Vincent and the Grenadines neighbourhoods' main needs

Education

In general terms, the family members of the fisheries sector in St. Vincent and the Grenadines have received primary or secondary education regardless of their gender. Illiteracy and semi-literacy have been observed in 2.09% of

⁵⁵ UBN stands for Unsatisfied Basic Needs, DQ for dwelling quality, EcC for economic capacity, ED for education, A.S for access to services. P.S stands for processing sector; E.F.S for extractive fishing sector and Aq. S for aquaculture sector

individuals studied. Tertiary education is represented by 2.62% of the individuals studied.

Economic capacity

St. Vincent and the Grenadines' households have a high **dependency on fisheries income**. Household members do not tend to belong to other sectors so households barely receive economic contributions from other sources of revenue.

Barrouallie and Fitz Hughes are the parishes with poor households, where average household income is insufficient to meet the financial needs of the average household members of those parishes; poor households do not have enough earnings to reach the US\$ 1,500 per year to cover the necessities of each household member.

Description of the extractive fishing sector households surveyed

According to the results, **96% of the fishermen** interviewed in St. Vincent and the Grenadines were **men**. In this profession, the age distribution seems to be concentrated among those aged between 36 and 65 years. This study reveals **in St. Vincent and the Grenadines a low participation in the sector of individuals under 26 years old and a high participation of individuals over 36 years including those over 65 years.**

Fishermen's **households are composed on average of 2.5 persons**, 57.78% men and 42.22% women. The results of this study indicate that this country has a high proportion of young population.

Economic importance of fishing

Fishing is an important activity that contributes to household livelihood, but households with more than one source of

income are more stable economically speaking. Households belonging to the fishing sector in St. Vincent barely receive financial contributions from other sectors (households **Importance of fishing within the Families Index 92.04%**), and the high proportion of young household members contributes to a **significant Economic Dependency Index**; each employed household member must financially support 1.99 unemployed household members.

Fishing also contributes to household economy in terms of **food security** through consumption of the household's catch. According to FAOstat, in St. Vincent and the Grenadines each individual consumes about 16.24 kilos per year of fishery products, not reaching the world average (16.7) (FAOstat 2007).

Fishing makes an **economic contribution at local level** by providing direct impacts related to sales as well as indirect impacts "upstream" and "downstream" through the commodity/supply chain. **In St. Vincent about 63% of each boat's costs are used in paying for fuel; 9.11% crew wages; 8.26% in paying for the oil; 8% in paying for the market taxes; and the rest is spent in paying for bait, ice and the maintenance of boat and gear.**

Activity

According to the results of the study, members of the extractive fishing sector in St. Vincent and the Grenadines are mainly engaged in **harvesting**, though **processing** of fisheries products and **gear and vessel construction and repair** are activities carried out to a lesser extent.

Productivity and profitability

Given the context of this study, St. Vincent and the Grenadines' vessels can be considered economically and physically productive. **Vessels have a significant**

volume of catch both in high and in low-season; generating in high season high revenues per vessel and per number of crew members.

Nevertheless, a high **interest in investing in fleet modernization has not been observed**. Only 41.18% of respondents claimed to have spent money from their savings in the last 5 years in gear maintenance and boat improvements and to a lesser extent in the purchase of boats and in engine maintenance. Only 39.13% of respondents claim that they will invest in the next 5 years in improving their fishery activities. **Buying new boats, engines and gear are the main objectives of fishermen**. To do this, fishermen will make use of their own savings or will request a loan. **Only 5.8% of fishermen** interviewed had ever received a loan for their income-generating fishery activities though 44% of them claim to have access to them.

Training and skills

Taking into account the results of the study, in St. Vincent and the Grenadines, only 13.89% of respondents have received fishery training.

This low figure indicates that **fishery training should be enhanced**. Training should not only be oriented to improving the quality of fishery products, it should also be conducted to guarantee crew safety and to improve fishing efficiency. In addition, it can be used to open up new avenues of income if it is decided to invest in processing and marketing.

Security systems

In St. Vincent and the Grenadines only 27.78% of fishermen interviewed said that they were participating in a social security system, with only 8.33% claiming to have received a government subsidy in the last 5 years, and 2.78% to have received some

form of non-governmental financial assistance.

Participation in a social security system should be promoted among the members of the extractive fishing sector in order for them to receive both short-term and long-term social benefits.

Presence of cooperatives

According to this Study, it would appear that **cooperatives** are not very extensive in St. Vincent and the Grenadines, with only **22.22% of respondents claiming to belong** to one. This 22.22% of respondents are satisfied with their functioning.

Enhancing the role of cooperatives is recommended as it constitutes a type of co-management in which government and users cooperate together as equal partners in the decision-making process. Cooperatives can also provide legal advice; credit or financial assistance; training; gear and equipment at more reasonable prices; help with the marketing and distribution of products, etc.

Co-management with fishermen's organizations results in increased stewardship as well as greater responsibility and authority among the fishermen.

Knowledge of policy regulations

The Study shows that St. Vincent and the Grenadines fishermen **do not feel that they are involved in the decision-making process**, with 25% saying that they are consulted by the fisheries administration, as individuals or through associations. Furthermore, they show **a medium level knowledge concerning the existence of national or regional strategies and management plan and only 68% of them claim to be familiar with laws and regulations** related to their sector.

Environmental considerations

Sustainable development and exploitation of fishing resources can only be guaranteed through deep scientific knowledge of the marine ecosystem and biodiversity of the country, social awareness and systemic environmental control and monitoring.

Directives for improving good environmental practices, protection of rare species caught and marketing level are crucial for the sustainability of resources.

From the results of the study, it can be said that **fishermen only have a medium awareness of the necessity of conserving the resources**, though 68% of fishermen have observed a reduction in catches in the recent years and 16% of them are not in favour of creating more protected areas in their country, and 45.8% do not care if they are created or not. Even though 61% of interviewees think that they have a positive impact on fishing. **Given these results, it is important to find out the reason for this way of thinking and see if created protected areas are well planned and implemented and how they affect fishermen's activity. If the objectives are being met, then the fishermen should be informed of the importance of protected areas in fisheries.**

The need to change target species and the decline in catches are the main reasons why **98.6% of fishermen have to change fishing grounds up to four times a year. Fishermen attribute the decline in catches to climate change; overfishing; natural disaster; and to different kinds of pollution.**

Main concerns of the sector

Being aware of the needs and concerns of the sector is fundamental in establishing

political and social action to strengthen fisheries and fisheries sector livelihoods.

The results of the Study show that St. Vincent and the Grenadines fishermen's main concerns are those related to the need to **seek new fishing grounds; problems regarding infrastructures for unloading; illegal fishing; constraints in meeting supply and maintenance needs; piracy and vandalism.** Regarding issues related to marketing, fishermen seem concerned mainly with **insufficient markets and low fish price**; and to a lesser extent with **lack of handling and preservation facilities and low product demand.**

Description of the processing sector households surveyed

The processing sector in St. Vincent and the Grenadines is mainly composed of **businesses that have been running more than ten years.** The analysis of the results indicates that the same proportion of men and women was surveyed. All women were between 15 and 25, or between 46 to 55 years old, while men's ages ranged from 36 to 55. Processing sector households are composed on average of **2.75 persons.**

Finance, investments and business growth expectations

A well developed and profitable processing sector is critical to the economy of a country as it economically **adds value to fisheries products**, and is a **source of employment**, especially for **women and individuals with low skill profiles.**

In St. Vincent and the Grenadines, the processing industry appears to be financed mainly by government assistance and to a lesser extent by personal savings. All companies surveyed intend to continue working in the future and 75% also intend to continue investing in modernization of the company.

As mentioned before, the general trend of those interviewed is the **interest in moving to a more suitable location and upgrading Hazard Analysis Critical Control Points**.

All businesses participating in this Study seem to provide **training courses** to their workers. The main courses are related to **improving quality and adding value to processing products and Hazard Analysis Critical Control Points (HACCP) training**.

Productivity and profitability

Though half of the businesses are able to **supply their products throughout the whole year**, none of them **operate at full capacity**.

The fishery product processing industry in St. Vincent and the Grenadines is focused on **pelagic species and snapper preparation**. Fish tend to be prepared in a fresh or refrigerated presentation, or vacuum-packed. Among the pelagic fishes processed abounds the dolphinfish and other large pelagic such as barracuda, wahoo, black-fin tuna and other types of tuna. These **processing plants do not only handle fish products, but they also process other types of food**. **Packaging and Distribution** activities are also carried out in a large proportion of processing businesses.

Raw material is purchased directly from local fishermen and markets or can also be imported. As regards to the **marketing** of processed products, they are mainly sold in the **local and national markets** with also a small percentage of **exports at the regional level to Barbados and Antigua and Barbuda**.

Revenues are based on sales and other non-specified sources of income, but 12% of incomes are also due to subsidies or donations. As for expenses, they focus on

payment of staff salaries (38.36%); raw materials (25%); and supplies such as fuel, electricity or gas (20.9%); and to a lesser extent to pay for containers, packaging and transport; rentals; the National Social Security contribution and the Quality Assurance System.

Employment and Security systems

In terms of the personnel who work in businesses related to the processing industry, in general, most of the St. Vincent and the Grenadines full-time and part-time workers are women. Most personnel occupy unskilled jobs regardless of sex.

In St. Vincent and the Grenadines, **almost all companies are involved in the social security systems (75% of them) but only 33.33% are covered by some form of insurance**. In terms of financial assistance, a significant participation of governmental and non-governmental assistance is observed. **50% of the processing businesses claim to have received some kind of governmental subsidy and/or have been assisted by non-governmental organizations**.

Presence of cooperatives

Cooperatives are not involved in Saint Vincent and the Grenadines' processing sector, no company claims to belong to a cooperative.

As said before, **co-management results in increased stewardship as well as greater responsibility and authority among the processing companies**.

Knowledge of policy regulations

The Study shows that St. Vincent and the Grenadines' members of processing sector **feel they have a medium involvement in the decision-making process**, as 50% of them claim to be consulted by the

administration during the planning processes. They show also a **medium-high level knowledge concerning laws and regulations** related to their sector.

Environmental considerations

As for the relationship of the processing industry in St. Vincent and the Grenadines and the environment, **no involvement in wastewater treatment was observed. Solid waste is mainly disposed in the garbage dump, though 25% of companies resort to packaging waste management companies to manage them.**

The main source of energy used in the processing industry is electricity, though fuel oil and gas are also used. No by-products are obtained.

Half of St. Vincent and the Grenadines processing industry companies carry out hygiene and sanitary controls of raw materials.

Main concerns of the sector

Being aware of the needs and concerns of the sector it is fundamental to establish political and social action to strengthen processing sector's livelihoods.

The results of the Study show that in St. Vincent and the Grenadines, the **main concerns** of the processing sector are those related to **the difficulty in gaining access to electricity; difficulties in finding specialized staff; problems regarding the supply of materials; bureaucratic problems and difficulties in fulfilment of environmental requirements.**

The Study also reveals that the main **development actions** for the processing sector demanded by the respondents are the **design and implementation of an action plan; promotion of producers' organizations; promotion of**

consumption and market opportunities for processed products; implementation of HACCP and traceability systems; and promotion of investment in the sector.

Recommendations

This is a brief review of some of the recommendations proposed in Section V of this report and in the Policy Document. For a more in-depth explanation it is recommended to use them.

- √ Policy processes should be improved by:
 - conducting regular reviews and analysis of policies.
 - Encouraging co-management.
- √ A Fishermen's Pension and Social Security Benefit Scheme should be established within a legal framework.
- √ Social measures to help the poorer households to meet the basic needs should also be established.
- √ A financial support plan should be developed and introduced, in strong collaboration with related financial agencies and governments, to provide fisherfolk and fishers' organizations with access to credit for investment in responsible fishing gear and technologies, safety gear and safer practices. The financial plan should include micro-finance schemes.
- √ Training programs should be continued.
- √ Sector awareness on relevant issues that directly affect its activity, such as resource protection/conservation, the need for team management, participation in decision-making process, etc, must be promoted.
- √ Fishery products market structure must be improved. Docks, markets,

refrigerated storage and processing areas need building or renovating.

- √ Distribution must be improved by extending distribution channels allowing fish to reach as many communities as possible in the best condition.
- √ Measures designed to reduce post-capture loss should be reinforced.
- √ A Regular supply of fish to facilitate the organization of the market should be ensured.
- √ The administration in charge of managing fisheries should aim: to monitor fishing effort and enforce fishing regulations (MCS); to monitor fish stocks and advise on appropriate levels of exploitation of major commercial stocks; to report on the volume and value of production in the sector; to inform and instruct fishers on new technology through extension services. Fighting against IUU fishing and vandalism is key.
- √ Participation of women in the three sectors studied should be encouraged.
- √ Participation of the youth in the three sectors studied should be encouraged.
- √ Good environmental practices must be promoted among the three sectors studied.
- √ Promotion of the creation of marine protected areas should be continued.
- √ Conduct a study to determine the aquaculture potential of the country.

Main Findings of the Diagnostic Study to Determine the Levels of Poverty in Fishing Communities in Selected CARICOM Countries:



TRINIDAD AND TOBAGO

Key facts⁵⁶

Population 2011 *	1,227,505
Net primary enrolment **	98%
Direct and indirect jobs in fisheries sector	9,000
Services **	49%
GDP by Sector 2009 Industry **	51%
Agriculture **	0%
Fisheries sector ***	0.07%

The sample studied

In Trinidad data are broken down by counties, while in Tobago, to obtain more disaggregated data, they are presented by parishes. All counties were surveyed. Chart 41 shows the number of surveys conducted in each county or parish studied.

T & T counties or parishes surveyed	Aquaculture	Fishermen	Processing	Total
Caroni	7	7	2	16
St Andrew	2	-	-	2
St. George	1	14	6	21
Victoria	6	7	-	13
St. Patrick	-	14	-	14
Mayaro	-	6	-	6
Nariva	-	10	-	10
St. Andrew	-	4	-	4
St. David	-	5	-	5
St. Mary / East	-	4	-	4
St. Mary / North East	-	7	-	7
St. David / South West	-	13	4	17
St. Patrick / South West	-	3	2	5
St. Andrews / South West	-	11	-	11
St. John / East	-	8	-	8
St. George / East	-	3	2	5
St David/ North East	-	4	-	4
St. Paul / East	-	5	-	5
Total general	16	125	16	157

Chart 41 Completed questionnaires by sector and county/parish sampled in Trinidad and Tobago

Main Findings of the Study

The extent of poverty in households of the fisheries sector in Trinidad and Tobago

Vulnerable households (15.23%) are present in eleven of the eighteen areas studied; but poor homes (1.32%) are relegated to the north-eastern part of Saint Mary in Tobago, and to Saint Patrick in Trinidad. Poor households in each of these areas represent only 0.66% of total households covered in the survey (Chart 42).

Trinidad and Tobago Region	Non-poor	Vulnerable	Poor	% Responses per Region
Nariva	6.62%	0%	0%	6.62%
St. Andrew	3.97%	0%	0%	3.97%
St. George / East	2.65%	0%	0%	2.65%
St. John / East	5.30%	0%	0%	5.30%
St. Mary / East	2.65%	0%	0%	2.65%
St. Paul / East	3.31%	0%	0%	3.31%
Mayaro	3.31%	0.66%	0%	3.97%
St. David / South West	10.60%	0.66%	0%	11.26%
St. George	12.58%	0.66%	0%	13.25%
Victoria	6.62%	0.66%	0%	7.28%
St David/ North East	1.32%	1.32%	0%	2.65%
St. Andrews / South West	5.96%	1.32%	0%	7.28%
St. David	1.99%	1.32%	0%	3.31%
Caroni	7.95%	1.99%	0%	9.93%
St. Patrick / South West	1.32%	1.99%	0%	3.31%
St. Mary / North East	1.32%	1.99%	0.66%	3.97%
St. Patrick	5.96%	2.65%	0.66%	9.27%
T & T	83.44%	15.23%	1.32%	100%

Chart 42 Extent of poverty in households of the fisheries sector. Trinidad and Tobago

The main constraints of vulnerable and poor households are related mainly to **education and economic capacity**.

⁵⁶ * CIA Factbook; ** 2011 Commonwealth Yearbook; *** National fisheries officers 2010

Chart 43⁵⁷ disaggregates by county/parish the vulnerabilities detected in the data analysis. **Special attention should be given to these regions and their needs.**

Trinidad and Tobago county/parish surveyed	Constraints	Condition of household	Sector
Caroni	Ec. C; ED	Vulnerable	Aq. E.F.S
St. George	Economic capacity	Vulnerable	Extractive fishing
Victoria	Education	Vulnerable	Aquaculture
St. Patrick	D.Q; ED; Ec.C; A.S	Vulnerable and poor	Extractive fishing
Mayaro	Access to services	Vulnerable	Extractive fishing
St. David	Economic capacity	Vulnerable	Extractive fishing
St. Mary / North East	D.Q; ED; Ec.C	Vulnerable and poor	Extractive fishing
St. David / South West	Economic capacity	Vulnerable	Extractive fishing
St. Patrick / South West	Education	Vulnerable	P.S; E.F.S
St. Andrews / South West	Education	Vulnerable	Extractive fishing
St David/ North East	Education	Vulnerable	Extractive fishing

Chart 43 Main constraints by county/parish. Trinidad and Tobago

Living conditions and access to services

In general Trinidad and Tobago dwellings are undivided private houses. They are built with solid materials and have an optimum access to services. However, some vulnerable households from St. Patrick, less than 0.65% of all households surveyed, do not have access in their homes to running water, electricity and shower. Also some non-poor households from St. John's and St. David do not have access to sewage systems for water removal.

Concerning ownership of durable goods, households can afford having almost all durable goods described in this study, motor vehicles being the only material possession that 34.24% of households could not afford.

⁵⁷ UBN stands for Unsatisfied Basic Needs, DQ for dwelling quality, EcC for economic capacity, ED for education, A.S for access to services. P.S stands for processing sector; E.F.S for extractive fishing sector and Aq. S for aquaculture sector

The interviewees' main concerns related to their **neighbourhood needs** are the **asphalting of roadways** (30.59% of interviewees); the need to strengthen the **drainage network** (20.09%), **running water** (9%), more **health centres** (9%) and **public transport** (8.6%). Chart 44 shows the main neighbourhoods' needs by county/parish identified in this study.

Trinidad and Tobago regions surveyed	Neighbourhood needs
St. Patrick / South West St. George / East	Asphalting
St David/ North East	Health centre
Caroni	Public school; Garbage dump; Health centre; Drainage network; Asphalting; Rubbish collection
St Andrew	Health centre; Drainage network; Asphalting; Rubbish collection
St. George	Garbage dump; Water-treatment plant; Electricity; Gas; Public transport; Drainage network; Asphalting; Rubbish collection
Victoria	Electricity; Public transport; Drainage network; Asphalting; Rubbish collection
St. Patrick Nariva	Gas; Public transport; Health centre; Drainage network; Asphalting; Rubbish collection
Mayaro St. David / South West	Public transport; Drainage network; Asphalting
St. David	Electricity; Gas; Public transport; Health centre; Asphalting
St. Mary / East	Gas; Health centre; Asphalting
St. Mary / North East	Public school; Gas; Public transport; Health centre; Drainage network; Asphalting
St. Andrews / South West	Health centre; Drainage network; Asphalting
St. John / East	Gas; Health centre; Asphalting; Rubbish collection

Chart 44 Main needs of neighbourhoods. Trinidad and Tobago

Education

In general terms, the family members of the fisheries sector in Trinidad and Tobago have received primary or secondary education regardless of their gender. Illiteracy and semi-literacy have been observed in 1.64% of individuals

studied. Tertiary education is represented by 8.9% of the individuals studied.

Economic capacity

Trinidad and Tobago households have a considerable **dependency on fisheries income**. Household members do not tend to belong to other sectors so households barely receive economic contributions from other sources of revenue.

North East of St. Mary and St. Patrick are the regions with poor households, where the average household income is insufficient to meet the financial needs of the average household members of those regions; households do not have enough earnings to reach the US\$ 1,500 per year to cover the necessities of each household member.

Description of extractive fishing sector's households surveyed

According to the results **95% of the fishermen** interviewed in Trinidad and Tobago were **men**. In this profession, the age distribution seems to be concentrated among those aged between 26 and 45 years old. Fishermen between 46 and 65 years of age are also representative. This study reveals **in Trinidad and Tobago a low participation in the sector of individuals under 26 years old and a high participation of individuals over 36 years old included those over 65.**

Fishermen's households are composed **on average of 2.64 persons**, 60.75% men and 39.25% women. The results of this Study indicate that the percentage of individuals by age group is quite homogeneous, especially for those less than 45 years of age.

Economic importance of fishing

Fishing is an important activity that contributes to household livelihood, but households with more than one source of income are more stable economically speaking. Households belonging to the fishing sector in Trinidad and Tobago barely receive financial contributions from other sectors (households **Importance of fishing within the Families Index 84.22%**). However, a relatively low unemployment rate results in a **relatively low Economic Dependency Index**; each employed household member must financially support 1.62 unemployed household members.

Fishing also contributes to household economy in terms of **food security** through consumption of the household's catch. According to FAOstat, in Trinidad and Tobago each individual consumes about 14.39 kilos per year of fishery products, not reaching the world average (16.7) (FAOstat 2007)

Fishing makes an **economic contribution at the local level** by providing direct impacts related to sales as well as indirect impacts "upstream" and "downstream" through the commodity/supply chain. **In Trinidad and Tobago 40.82% of each boat's costs are used in paying fuel; 24.47% in crew wages; 10.76% in paying for ice; 8.82% paying for the bait; 7.32% for oil; and the rest is spent in paying the maintenance of boat, engine and gears.**

Activity

According to the results of the Study, members of the extractive fishing sector in Trinidad and Tobago not only are engaged in **harvesting**, they are also responsible for the **marketing. Gear and vessels construction and repair and processing of fisheries products are activities carried out to a lesser extent.**

Productivity and profitability

Given the context of this Study, Trinidad and Tobago's vessels can be considered economically and physically productive. **Vessels have a significant volume of catch above all in high season; generating high revenues per vessel and per number of crew members.**

A reasonable **interest in investing in fleet modernization has been observed.** 52.8% of respondents claimed to have spent money from their savings in the last 5 years in boat improvements and in the purchase of boats, gears and engines. 62.3% of respondents claim that they will invest in the next 5 years in improving their fisheries activities. **Buying new boats, gear, and engines, continue to be the main objectives of fishermen.** To do this, fishermen will make use of their own savings or will request a loan. **Only 31.71% of fishermen** interviewed had ever received a loan for their income-generating fisheries activities. 56.56% of fishermen interviewed claim to have access to loans.

Training and skills

The Government of Trinidad and Tobago continues to support the "Caribbean Fisheries Training and Development Institute" established with the assistance from FAO, which provides a broad range of courses in both maritime and seafood technologies to meet the training requirements of fishers in the Caribbean.

This is the second country of this Study with the highest rate of fishermen benefiting from training courses (26.56% of respondents). However, this is considered a low figure and **fisheries training should be enhanced.** Training should not only be oriented to improving the quality of fishery products, it should also be conducted to guarantee the crew's safety and to improve fishing efficiency. In

addition, it can be used to open up new avenues of income if it is decided to invest in processing and marketing.

Security systems

In Trinidad and Tobago only 14.06% of fishermen interviewed said that they were participating in a social security system, with 25% claiming to have received a government subsidy in the last 5 years, and 11.72% have received some form of non-governmental financial assistance.

According to information provided by the Government of Trinidad and Tobago in its **Fisheries and Aquaculture Statistics Report of 2010**, in both 2008 and 2009, Government subsidized the fishing sector with TT\$ 7,000,000. Subsidies focused primarily on VAT waivers for locally purchased marine accessories and engine parts; fuel rebates and VAT exemptions for imported marine accessories for imported marine accessories, engine parts and new engine⁵⁸.

Participation in a social security system should be promoted among the members of extractive fishing sector in order for them to receive both short-term and long-term social benefits.

Presence of cooperatives

According to this Study, it would appear that **cooperatives** are not extensive in Trinidad and Tobago, with **34.38% of respondents claiming to belong** to one, and only 21.88% of respondents believing in their proper functioning.

Enhancing the role of cooperatives is recommended as it constitutes a type of co-management in which government and users cooperate together as equal partners in the decision-making process. Cooperatives can also provide legal

⁵⁸ Fisheries and Aquaculture Statistics 2010 Report. Ministry of Food Production, Land and Marine Affairs' web site

advice; credit or financial assistance; training; gear and equipment at more reasonable prices; help with the marketing and distribution of products, etc.

Co-management with fishermen's organizations results in increased stewardship as well as greater responsibility and authority among the fishermen.

Knowledge of policy regulations

The Study shows that Trinidad and Tobago's fishermen **do not feel that they are very involved in the decision making process, with 42% saying that they are consulted by the fisheries administration, as individuals or through associations.** Furthermore, they show a **medium level knowledge concerning the existence of national or regional strategies and management plans, and only 49% of them being familiar with laws and regulations related to their sector.**

Environmental considerations

Sustainable development and exploitation of fishing resources can only be guaranteed through deep scientific knowledge of the marine ecosystem and biodiversity of the country, social awareness and systemic environmental control and monitoring.

Directives for improving good environmental practices, protection of rare species caught and marketing level are crucial for the sustainability of resources.

From the results of the study, it can be said that **Trinidad and Tobago' fishermen have a medium awareness of the necessity of conserving the resources, 83.7% of fishermen have observed a reduction in catches in the recent years,**

and 67% indicate that they have observed a reduction in size of species caught. Fishermen mainly attribute this reduction in catches and size to industrial and other sources of pollution and to a lesser extent to climate change; deterioration of habitats; and overfishing.

The decline in catches and the need to change target species are the main reasons why **97.6% of Trinidad and Tobago' fishermen have to change fishing grounds up to four times a year.**

The Study reveals that **they also have a medium awareness of the importance of marine protected areas,** with 40% of them thinking that they have a positive impact on fishing, and 49% of fishermen interviewed being **in favour of creating new marine protected areas.**

Main concerns of the sector

Being aware of the needs and concerns of the sector is fundamental in establishing political and social action to strengthen fisheries and fisheries sector livelihoods.

The results of the Study show that in Trinidad and Tobago; fishermen's main concerns are those related to the need to **seek new fishing grounds; problems regarding infrastructures for unloading, coastguards, industrial and artisanal fishermen and illegal fishing; and constraints in meeting supply and maintenance needs.** Regarding issues related to marketing, Trinidad and Tobago fishermen seem concerned mainly with **insufficient markets and handling and preservation facilities; low fish prices and to a lesser extent with low demand of fishing products, and lack of proper financing.**

Description of the processing sector households surveyed

The processing sector in Trinidad and Tobago is mainly composed of **businesses that have been running more than five years**. The analysis of the results indicates that 81.25% of interviewees were men while only 18.75% were women. All women were between 36 and 55 years of old, while men's ages ranged from 36 to 65. Processing sector **households are composed on average of 2.81 persons**.

Finance, investments and business growth expectations

A well developed and profitable processing sector is critical to the economy of a country as it economically adds value to **fisheries products, and is a source of employment, especially for women and individuals with low skill profiles**.

In Trinidad and Tobago, the processing industry appears to be financed mainly by personal savings and to a lesser extent by national bank loans and partnerships. All companies surveyed intend to continue working in the future and 64.29% of them intend to continue investing in modernization of the company.

As mentioned before, the general trend of those interviewed is the **interest in enlarging and improving facilities condition and investing in new and modern equipment (freezers; smoking equipment, etc)**.

57% of the businesses participating in this Study seem to provide **training courses** to their workers. The main courses are related to **fish handling; health and safety and Hazard Analysis Critical Control Points**.

Productivity and profitability

Only 28.5% of the businesses **operate at full capacity**, and they are the only facilities able to **supply their products throughout the whole year**.

The processing industry is dedicated to the Processing of lobsters, shrimps, squids, clams and other bivalves that can be frozen, prepared or vacuum-packed. Among the fish species processed, the most important are catfishes, red snappers, white-mouth croakers and pelagic species such as king mackerel, serra spanish mackerel (carita), flying fish, dolphinfish, marlin, yellowfin tuna and swordfish. There is also a significant industry around the processing of tilapia. **Packaging and Distribution** activities and processing raw materials in value added products such as fish burgers or nuggets are also carried out as an important proportion of processing businesses.

Most of the raw material is imported, although some is purchased directly from local fishermen, designated local fishermen and vessels working for the factory. Also raw material is purchased from intermediary agents and fishermen from other communities. With regard to the **marketing** of processed products, they are mainly sold in the **local and national markets, with some exports at the regional and international levels to Barbados, Grenada and other CARICOM countries, and to USA and Canada**.

Revenues are based exclusively on sales. As for expenses, they focus on payment for raw materials (71.99%); staff salaries (12.61%); and to a lesser extent to pay supplies such as fuel, electricity or gas; paying containers and packaging; mortgage, and other costs.

Employment and Security systems

In terms of the personnel who work in businesses related to the processing industry, in general, most of the Trinidad and Tobago's full-time workers are women. It is noteworthy that most women occupy middle services or semi-skilled jobs while men tend to occupy skilled and semi-skilled jobs.

In Trinidad and Tobago, **only 56.25% companies are involved in the social security systems and 50% are covered by some form of insurance.** In terms of financial assistance, **only 6.25% of the processing businesses claim to have received any kind of governmental subsidy and/or have been assisted by non-governmental organizations.**

Presence of cooperatives

Cooperatives are partially involved in the Trinidad and Tobago's processing sector but they are not fully supported. 43% of companies claim to belong to a cooperative but only 21.43% of interviewees are satisfied with the services provided.

In Trinidad and Tobago, cooperatives are mainly involved in **education and marketing** of processed products, and to a lesser extent in **legal guidance and business management.**

As said before, **co-management results in increased stewardship as well as greater responsibility and authority among the processing companies.**

Knowledge of policy regulations

The Study shows that members of the processing sector in Trinidad and Tobago **do not feel involved in the decision-making process** as only 20% of them claim to be consulted by the administration during the planning processes.

Nevertheless they show a **full level knowledge concerning laws and regulations related to their sector.**

Environmental considerations

As for the relationship of the processing industry in Trinidad and Tobago and the environment, a significant **involvement in wastewater treatment has not been observed. Solid waste is mainly disposed in the garbage dump (62.5%), with 6% of companies resorting to packaging waste management companies, and the rest using solid waste to feed animals or disposing them directly to the sea.**

The main source of energy used in the processing industry is electricity, and to a lesser extent wood and gas. 9% of businesses obtain oils as by-products.

43% of processing industry companies in Trinidad and Tobago carries out hygiene and sanitary controls of raw materials.

Main concerns of the sector

Being aware of the needs and concerns of the sector is fundamental in establishing political and social action to strengthen processing sector's livelihoods.

The results of the Study shows that the **main concerns** of the processing sector in Trinidad and Tobago are those related to **the difficulty in gaining access to electricity; bureaucratic problems; problems regarding supplies; difficulties in distribution and transport of the product and in fulfilment of environmental requirements and gaining access to electricity.**

The Study also reveals that the main **development actions** for the processing sector demanded by the respondents are **promotion of market opportunities for processed products; promotion of**

producers' organizations; implementation of HACCP systems; speeding up of administrative procedures and training of specialised technicians.

Description of the aquaculture sector households surveyed

Aquaculture in Trinidad and Tobago, as in other parts of the world, is considered to be one of the avenues for supplementing the declining marine resources in an effort to meet the ever increasing demand for protein through fish and fish products. 62.5% of aquaculture farms have been operating less than 10 years.

According to the results, almost all of the interviewees of the aquaculture sector were men, with only 6.25% being women. All of them were over 36 years old and the bulk of age is between 46 and 65 years old. The aquaculture sector households are composed on average of 3.81 persons.

Finance, investments and business growth expectations

In Trinidad and Tobago, aquaculture farms appear to be financed mainly by **personal savings** and to a lesser extent by **national bank loans and governmental assistance**. **75% of aquaculture farms intend to continue working and investing in facilities' improvements.** Investments will focus on investing in modern equipment by building retaining walls to prevent flooding, investing in drainage systems, renewable energy etc, also trying to diversify the business to include eco-tourism and seeking new investors.

Trinidad and Tobago's Fisheries Division conducts "Introduction to Commercial Aquaculture" training courses. In the last three years (2009-2011), 120 persons have participated in the Basic Module; 102 in the Intermediate Module; and 63 in the

Advanced Module⁵⁹. However, this study reveals that only 20% of interviewees claim to have received training courses. Main courses focus on fish husbandry and farming and fish handling techniques.

Training should continue. Having trained staff means not only improving product quality, but also involves development of human capacity and improvement of worker safety.

Activity

Based on the results of the Study, in Trinidad and Tobago, aquaculture is organized into **subsistence (68.75%) small-scale (25%), and medium-scale (6.25) producers. Freshwater Extensive (93.75%) and intensive (6.25%)** production systems are practiced.

In general terms, farming facilities in Trinidad and Tobago are oriented to production, and to a lesser extent to ornamental fish culture (12.5%).

The aquaculture sector in Trinidad and Tobago is currently dominated by the culture of **tilapia; cascadura (*Hoplosternum littorale*;** and some ornamental fishes.

Productivity and profitability

Though 81.25% of farms are able to supply products throughout the year, none of them operates at full capacity. The main destination of the production is **national or local markets, though restocking and personal consumption is also important.** Fish is directly sold to the consumer without using intermediary agents; and a small percentage of production is sold to retailers and wholesalers.

⁵⁹ Fisheries and Aquaculture Statistics 2010. Ministry of Food Production, Land and Marine Affairs' web site.

Revenues are based on sales and other unspecified types of income, as for expenses, they focus on unspecified costs (73%); repairs and maintenance activities (9.25%); payment for staff costs (7.08%) and purchase of food (6.49%) and eggs and young fishes (2.3%).

Employment and Security systems

In terms of the personnel who work in businesses related to the aquaculture industry, in general, most of the Trinidad and Tobago's full-time and part-time workers are men. A 69% of the staff, regardless of gender, is unsalaried workers. Full-time workers occupy non-salaried; skilled and professional jobs.

Based on the Study, **none of salaried staff seems to be involved in the social security systems**, and only 6.25% of facilities are **covered by some form of insurance**. In terms of financial assistance only 6.25% of farms have received any government subsidy and no farm has received financial support by non-governmental organizations.

Participation in a social security system should be promoted among the members of aquaculture sector in order for them to receive both short-term and long-term social benefits.

The production of value-added products should also be encouraged through the provision of appropriate incentives.

Presence of cooperatives

Only 25% of interviewees declare to belong to a cooperative and only 12.5% are satisfied with the services provided.

In Trinidad and Tobago, cooperatives are mainly involved in **education** but also contribute to **legal guidance; marketing** of processed products; and to the **supply of fingerlings, food and other materials**.

Co-management is a power- and cost-sharing partnership that capitalizes on the knowledge and capacities of user groups and the government to create more legitimate, sustainable, equitable, and effective management systems.

Knowledge of policy regulations

The Study shows that members of the aquaculture sector in Trinidad and Tobago **do not feel involved in the decision-making process** as 68.7% of them are never consulted by the administration during the planning processes. They also show a **medium level knowledge concerning the existence of laws and regulations** related to their sector.

Environmental considerations

As for the relationship of the aquaculture industry and the environment, a **low involvement in wastewater treatment, only 37.5% of farms practice it; and in water recirculation, only 31.25% of farms**, has been observed. The main source of water is rainwater, though river water and water from reservoirs are also used. **Aeration systems are used in 43.75% of farms, while filters are used in 31.25%.**

Representatives of farms consider that feeding; quality of the water supply source and of the water in the facility; and plant location, are key environmental aspects for operating a farm.

Main concerns of the sector

Being aware of the needs and concerns of the sector is fundamental to establishing political and social action to strengthen processing sector's livelihoods.

The results of the Study show that the aquaculture sector's **main concerns** are related to **bureaucratic problems;**

difficulties in gaining access to electricity and other supplies; in gaining access to loans; and in distribution and transport of products.

The Study also reveals that the main **development actions** for the aquaculture sector demanded by the respondents are **the training of specialized technicians; boosting of Research, Development and Innovation (R+D+I); promoting the consumption of aquaculture products; promoting producers' organizations; and minimizing the negative impacts on the environment.**

Recommendations

This is a brief review of some of the recommendations proposed in Section V of this report and in the Policy Document. For a more in-depth explanation it is recommended to use them.

- √ Policy processes should be improved by:
 - conducting regular reviews and analysis of policies.
 - Encouraging co-management.
- √ A Fishermen's Pension and Social Security Benefit Scheme should be established within a legal framework.
- √ Social measures to help the poorer households to meet the basic needs should also be established.
- √ A financial support plan should be developed and introduced, in strong collaboration with related financial agencies and governments, to provide fisherfolk and fishers' organizations with access to credit for investment in responsible fishing gear and technologies, safety gear and safer practices. The financial plan should include micro-finance schemes.
- √ Training programs should be continued.
- √ Sector awareness on relevant issues that directly affect its activity, such as resource protection, the need for team management, participation in decision-making process, etc, must be promoted.
- √ Fishery products market structure must be improved. Docks, markets, refrigerated storage and processing areas need building or renovating.
- √ Distribution must be improved by extending distribution channels allowing fish to reach as many communities as possible in the best condition.
- √ Measures designed to reduce post-capture loss should be reinforced.
- √ A Regular supply of fish to facilitate the organization of the market should be ensured.
- √ The administration in charge of managing fisheries should aim: to monitor fishing effort and enforce fishing regulations (MCS); to monitor fish stocks and advise on appropriate levels of exploitation of major commercial stocks; to report on the volume and value of production in the sector; to inform and instruct fishers on new technology through extension services. Fighting against IUU fishing and vandalism is key.
- √ Participation of women in the three sectors studied should be encouraged.
- √ Participation of the youth in the three sectors studied should be encouraged.
- √ Good environmental practices must be promoted among the three sectors studied.
- √ Promotion of the creation of marine protected areas should be continued.
- √ Conduct a study to determine the aquaculture potential of the country.
- √ Productivity of aquaculture farms might be enhanced, by carrying out projects to improve the production conditions of the growth units which are in operation, by improving the management of infrastructure, the acquisition of fishing equipment, building structures for fish

manipulation and storage, etc. It will also assess the technological needs of energy supply and technology for the cultivation among others, and it will boost its acquisition, operation and maintenance.

APPENDIX II: Data Exploration Guide

9. Data exploitation

9.1 Relational Databases

A database is similar to a data file in that it is a storage place for data. Like a data file, a database does not present information directly to a user; the user runs an application that accesses data from the database and presents it to the user in an understandable format.

Database systems are more powerful than data files in that data is more highly organized. In a well-designed database, there are no duplicate pieces of data that the user or application must update at the same time. Related pieces of data are grouped together in a single structure or record, and relationships can be defined between these structures and records.

When working with data files, an application must be coded to work with the specific structure of each data file. In contrast, a database contains a catalog that applications use to determine how data is organized. Generic database applications can use the catalog to present users with data from different databases dynamically, without being tied to a specific data format.

A database typically has two main parts: first, the files holding the physical database and second, the database management system (DBMS) software that applications use to access data. The DBMS is responsible for enforcing the database structure, including:

- Maintaining relationships between data in the database.
- Ensuring that data is stored correctly and that the rules defining data relationships are not violated.
- Recovering all data to a point of known consistency in case of system failures.

All the information collected in the Survey was stored in an ACCESS database. This database contains all the objects needed to allocate the information and establish the relationship between them.

Although there are different ways to organize data in a database, relational databases are one of the most effective. Relational database systems are an application of mathematical set theory to the problem of effectively organizing data. In a relational database, data is collected into tables (called relations in relational theory).

A table represents some class of objects that are important to an organization. For example, a company may have a database with a table for employees, another table for customers, and another for stores. Each table is built of columns and rows (called attributes and tuples in relational theory). Each column represents some attribute of the object represented by the table. For example, an Employee table would typically have columns for attributes such as first name, last name, employee ID, department, pay grade, and job title. Each row represents an instance of the object represented by the table. For example, one row in the Employee table represents the employee who has employee ID 12345.

When organizing data into tables, you can usually find many different ways to define tables. Relational database theory defines a process called normalization, which ensures that the set of tables you define will organize your data effectively.

Database to store all data collected in the Survey is a unique data base file (Access) that contain all the objects needed to manage the information of the three questionnaire types. The database has been designed using the basic principles of database design.

9.2 Tables nomenclature

All tables related to the content of questionnaires have a name constructed according the type and section that is being referred. Next table list all the tables and their names:

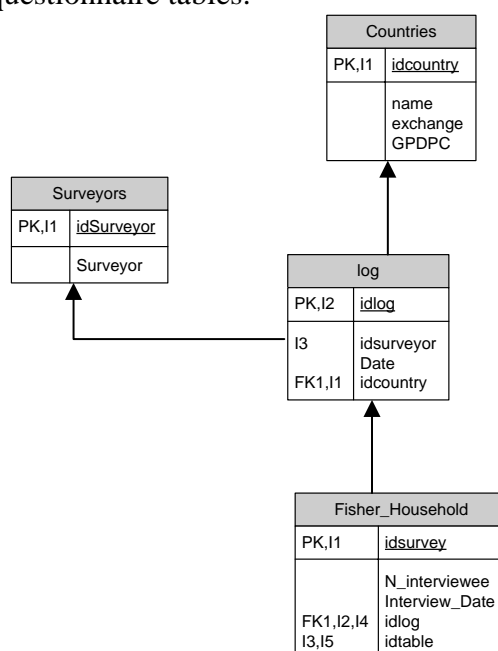
Type	Section	Name	Comments
Aquaculture	a	aquaculture_a	
Aquaculture	b (except b14)	aquaculture_b	
Aquaculture	b14	aquaculture_b14	B14 was split from b section to allow the table to have more than one register per table. Using this method the number of species that can be stored in the table per questionnaire is unlimited.
Aquaculture	c	aquaculture_c	
Aquaculture	d	aquaculture_d	
Aquaculture	e1	aquaculture_e1	E Section has been in two parts to do not surpass the maximum number of fields
Aquaculture	e2	aquaculture_e2	
Aquaculture	f	aquaculture_f	
Aquaculture	g	aquaculture_g	
Aquaculture	h	aquaculture_h	
Aquaculture	i	aquaculture_i	
Aquaculture	j	aquaculture_j	
Fishers	a	fishers_a	
Fishers	b	fishers_b	
Fishers	c	fishers_c	
Fishers	d	fishers_a	
Fishers	e (except e22)	fishers_e	e22 was split from b section to allow the table to have more than one register per table. Using this method the number of species that can be stored in the table per questionnaire is unlimited for either high and low season.
Fishers	e22 High season	fishers_e22_H	
Fishers	e22 Low season	fishers_e22_L	
Fishers	f	fishers_f	
Fishers	g	fishers_g	
Fishers	h	fishers_h	
Fishers	i	fishers_i	
Processing	a	processing_a	
Processing	b (except b11)	processing_b	
Processing	b11	processing_b11	B11 was split from b section to allow the table to have more than one register per table. Using this method the number of species that can be stored in the table per questionnaire is unlimited.
Processing	c	processing_c	
Processing	d	processing_d	
Processing	e	processing_e	
Processing	f	processing_f	
Processing	g	processing_g	
Processing	h	processing_h	
Processing	i	processing_i	
Processing	j	processing_j	
Household	a	household_a	
Household	b	household_b	
Household	c (except column 4)	household_c	C Section has been in two parts to do not surpass the

Type	Section	Name	Comments
Household	c (just column 4)	household_c_months	maximum number of fields
Household	c (just column 4 cont.)	household_c_months1	
Household	d	household_d	
Household	e	household_e	
Household	f	household_f	
Household	g	household_g	

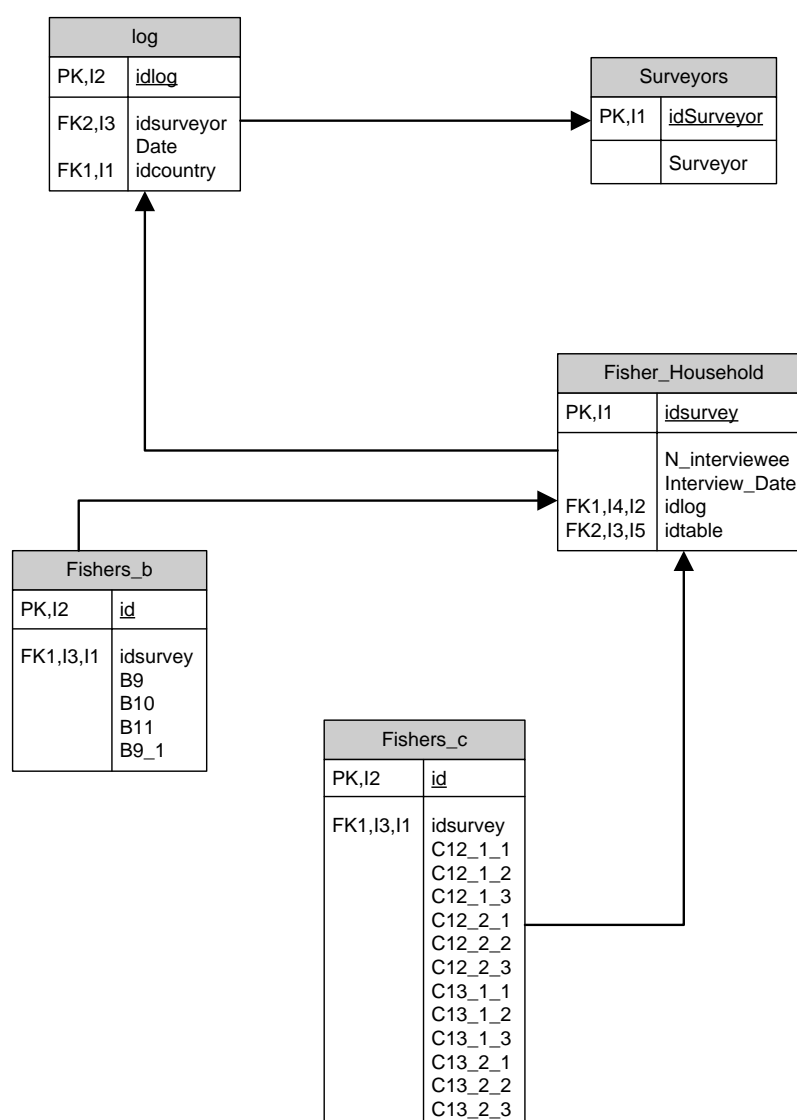
9.3 Database structure

There are three basic tables that will permit on to identify the country of the questionnaire, the surveyor and the different questionnaires (Fisherman, aquaculture and processing) with its related household questionnaire. These tables are:

- **Countries table.** Is the list of participating countries.
- **Surveyors.** Is the list of Participant surveyors.
- **Log.** This table registers all the sessions in the data entry program.
- **Fisher_household:** This table contains the information needed to relate the information of all questionnaire tables.



Objects are linked using the id of each table. “Log” and “country” table are joined by “idcountry”, “Surveyors” and “log” table are joined using “idsurveyor” and the questionnaire tables can be joined using “idsurvey”.



In the above figure two tables have been added to the basic structure.

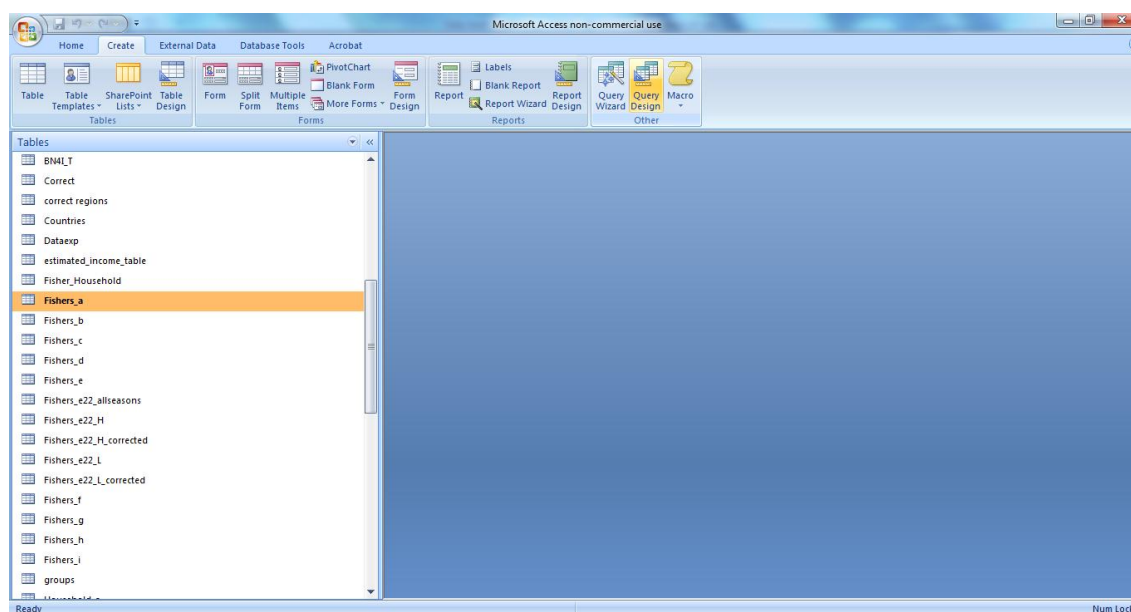
Other important tables are Answers tables. These tables list all the possible values of the answers and its descriptions. These tables have no relation and must be used to translate codes into texts.

9.4 Query building

In this section an example will illustrate how the queries can be constructed to obtain the requested information.

As an example the information by country about vessel hull material is requested. First of all we have to identify the variables:

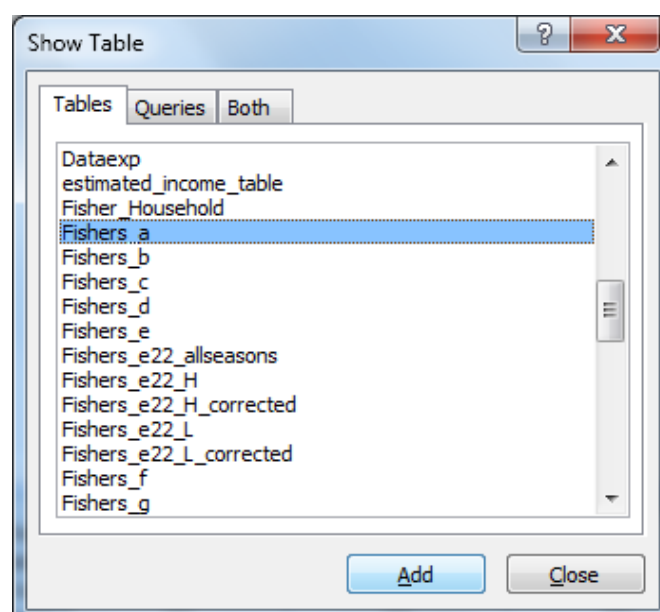
- **Country.** This variable is in the “countries” table and the needed field is “name”.
- **Hull material.** This variable is in the fishermen questionnaire section a. Then the table is Fishers_a. The variable is A72 (second item of question 7).



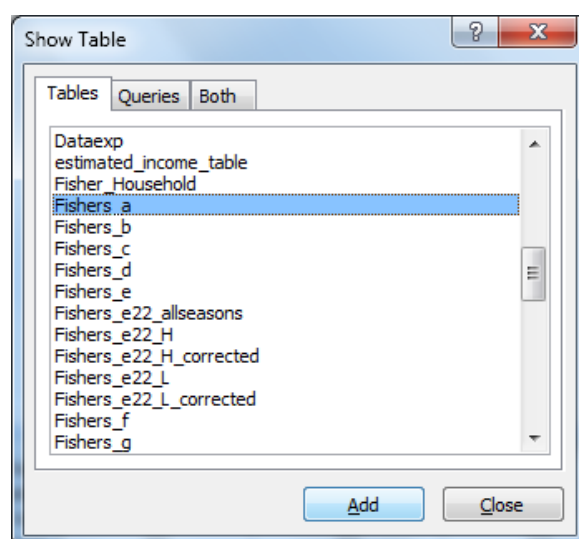
Open Access database and select “Create” tab.

Select query design to build a new query.

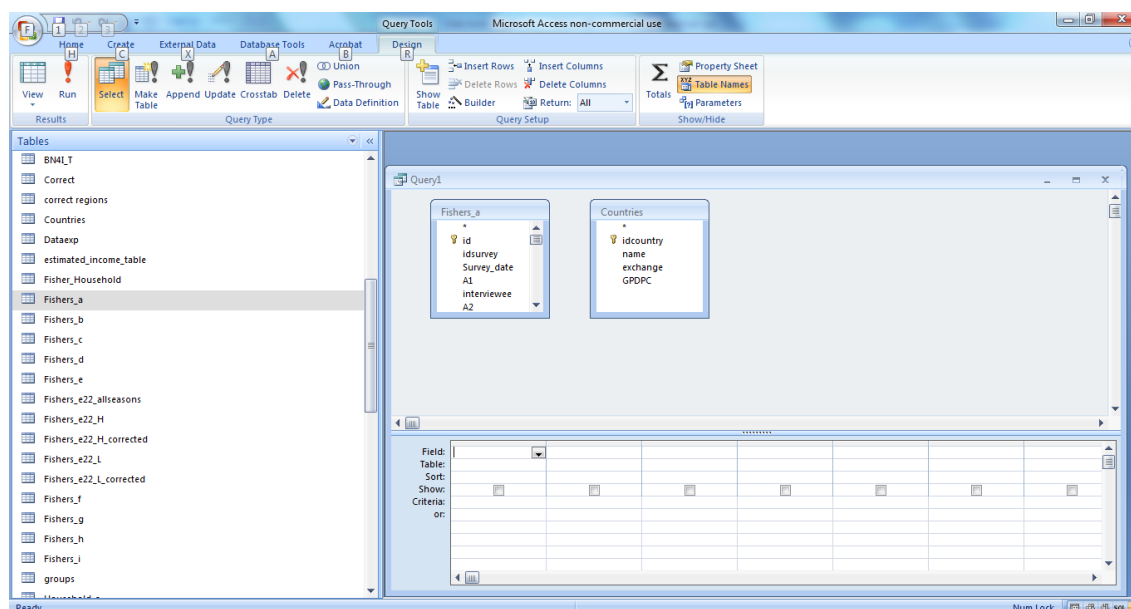
Select “Fishers_a” table and click add button.



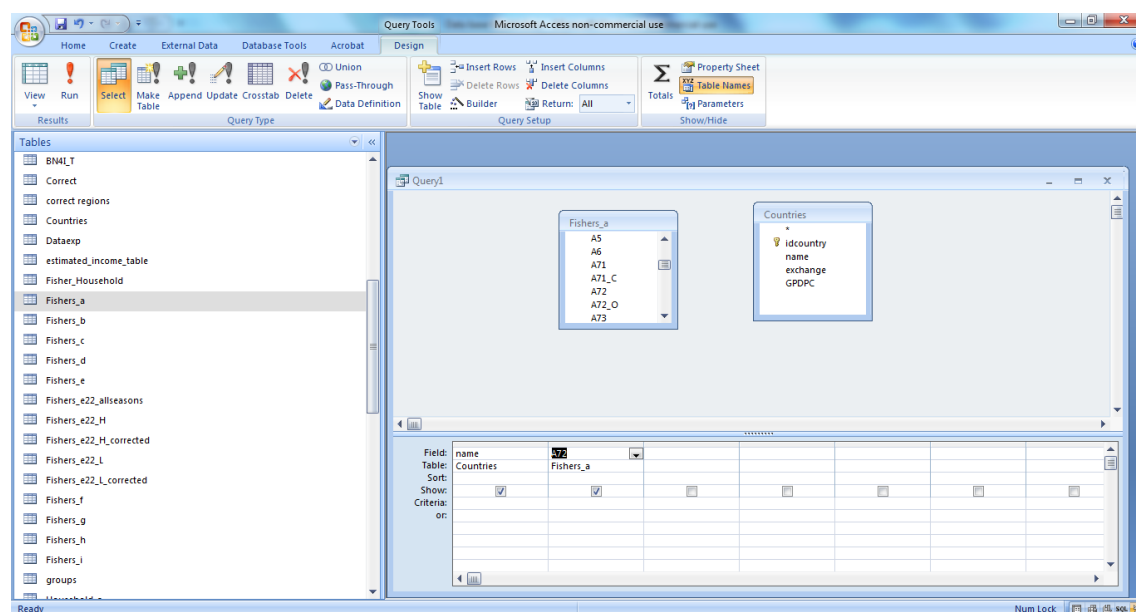
Select “countries” table and click add button



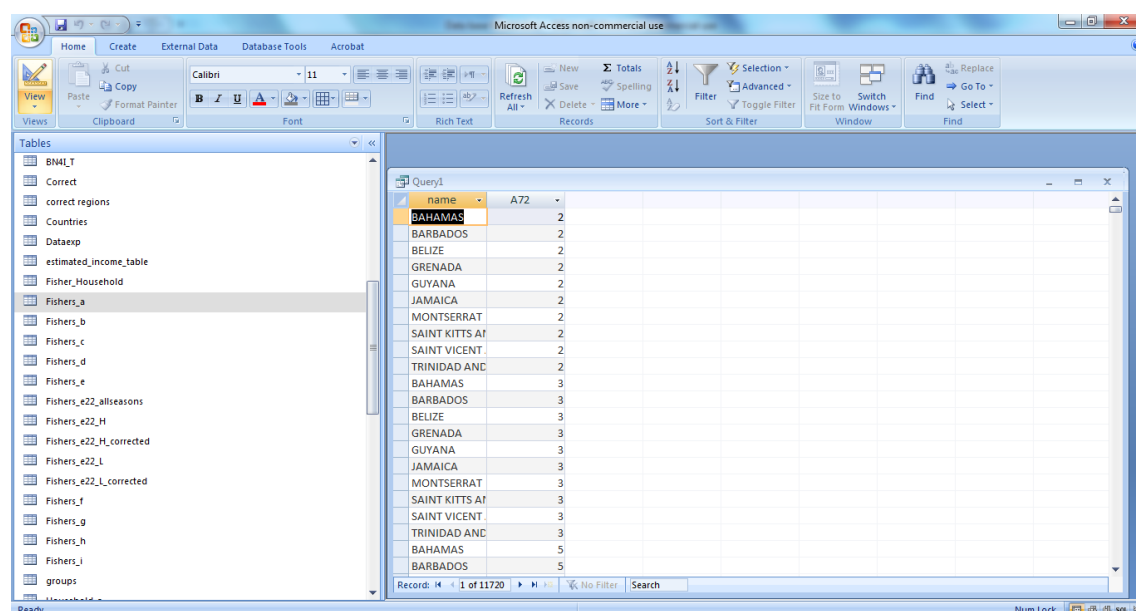
Click close button to go to design screen.



In the design screen the selected tables appear. Double clicking in the needed fields it is possible to select the fields to show in the query.



Selecting “Run” option the query can be executed.



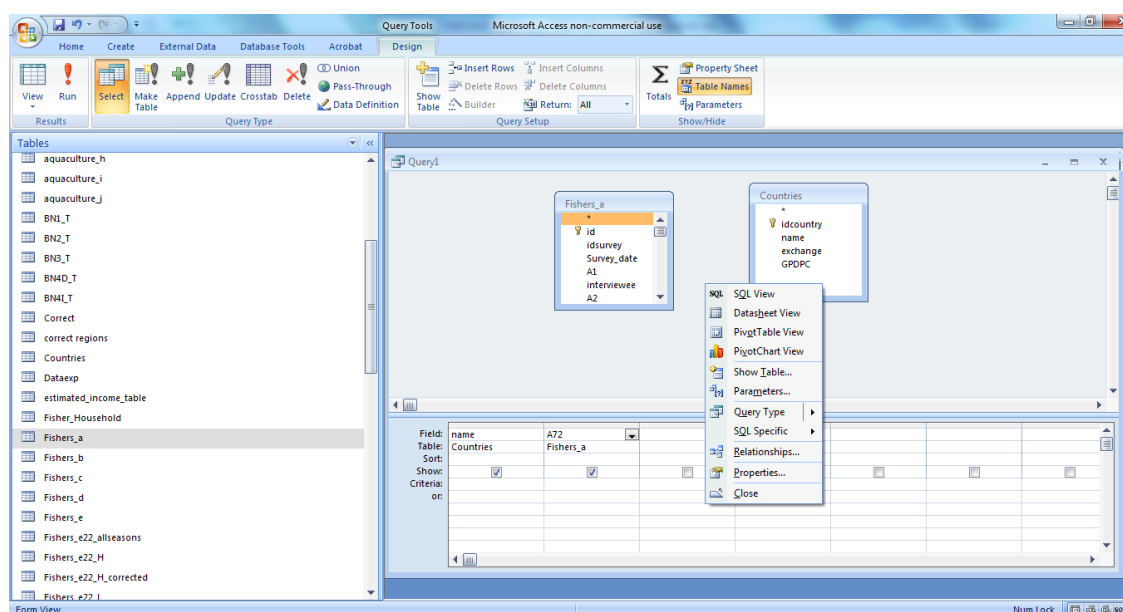
The number of records appears in the bottom part of the screen, in this case 11720 registers. Table fishers_a has 1172 records and countries table has 10 records. This query represent the Cartesian product of both tables, final number of records is 1172×10 .

But this query is not useful for our example because we need to relate one record in the table countries to one record in the table fishers_a. We need to establish relationships.

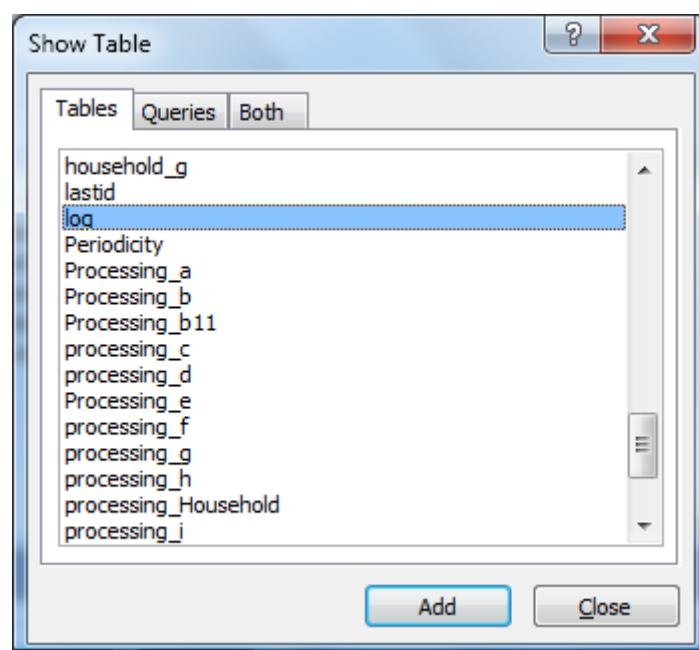
Following the database structure described above we need one more table to establish the relations between fishers_a and countries, the “log” table.



To come back to design mode select “design view” option .



By clicking the right button of the mouse a menu appears showing different options. Select show table and then select log table. Click add button to add the table to the design.

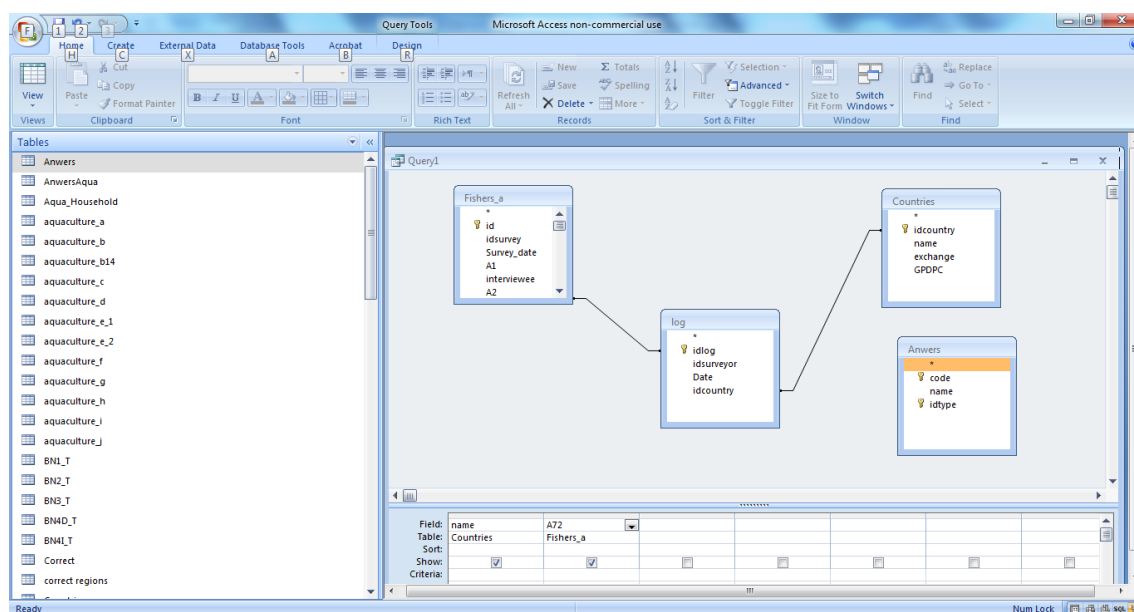


Press close button.

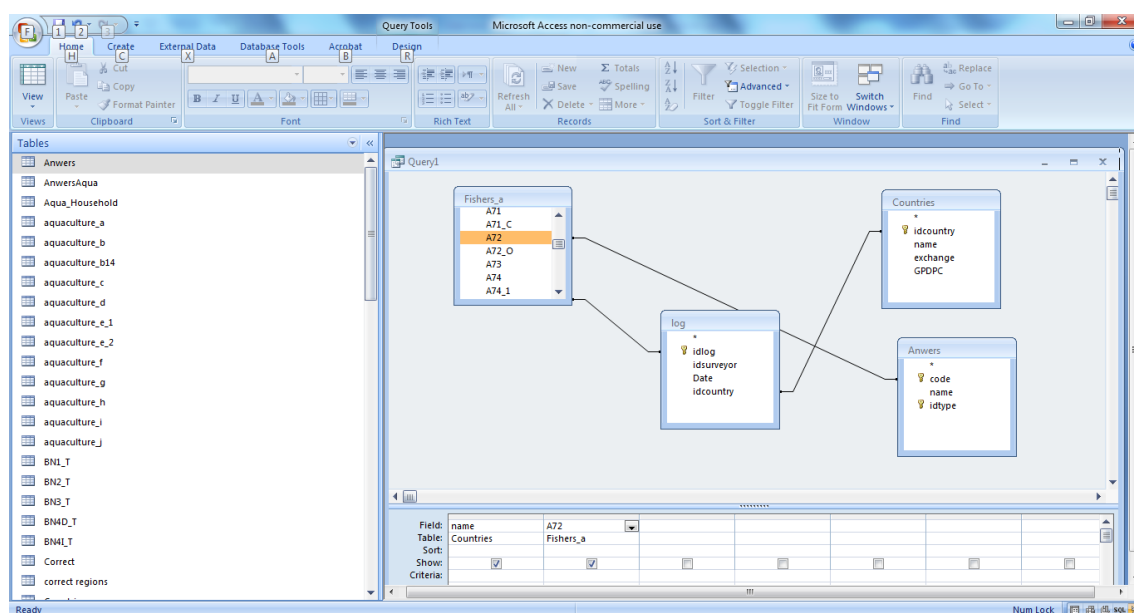


Downloaded from <http://ajphaphysocpharm.sagepub.com/> at 11:01 11 November 2014


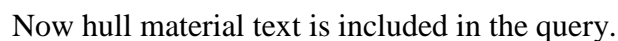




Answers table appears without any relation. It is necessary to relate a72 variable to the field code of answers table. This can be done by clicking the field a72 and keeping the mouse button down and drag the line to the target field (code from answers table). It can be shown how the relation is established.



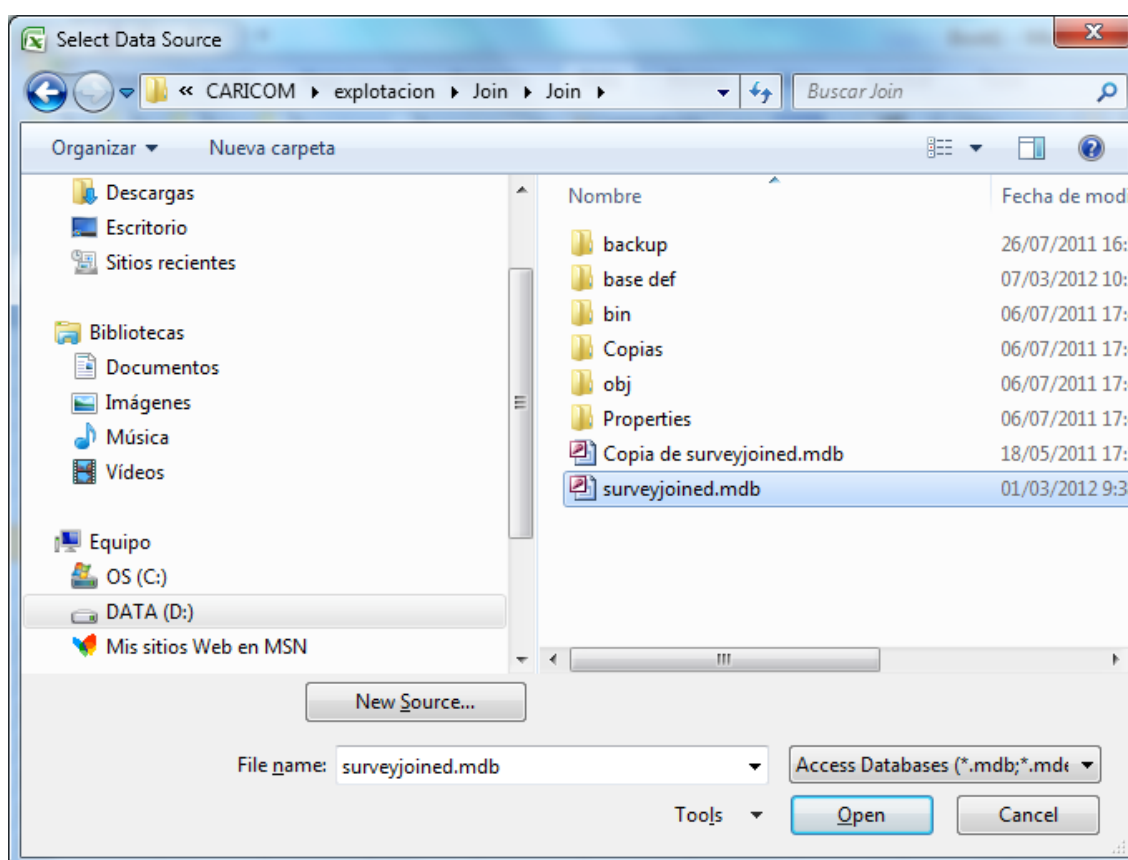
Now it is necessary to indicate to the database which type of answer contains the hull material. By double-clicking "idtype" field from answer table it is possible to restrict in criteria row type of answer. Checking the answer table it is possible to know answer type number, in this case is 25.

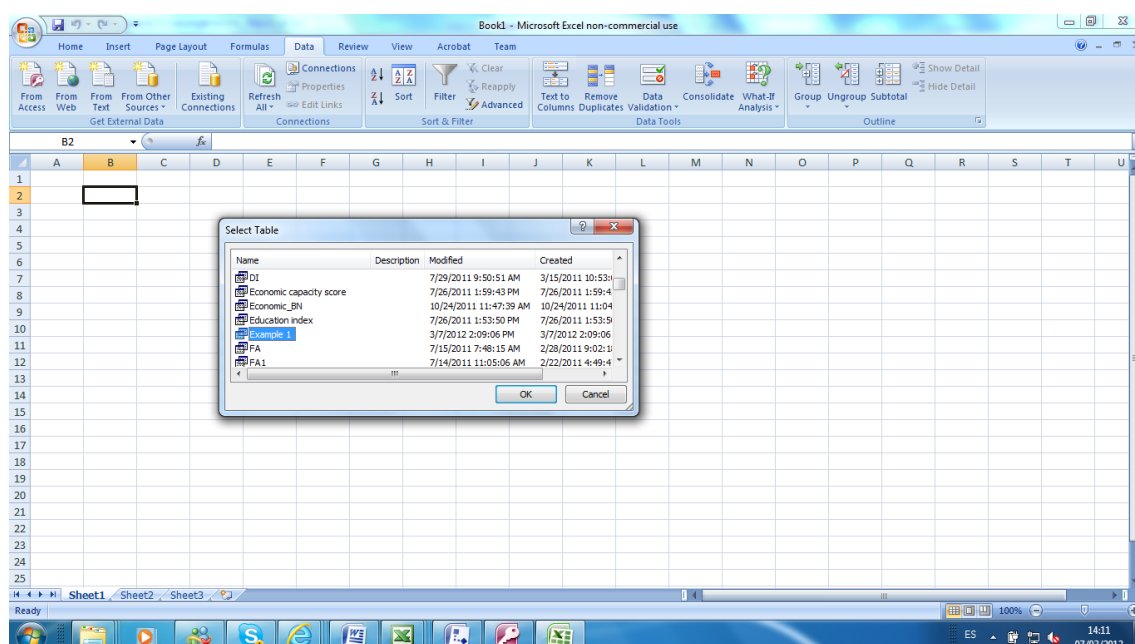


9.5 Obtain descriptive statistics. Excel Pivot tables

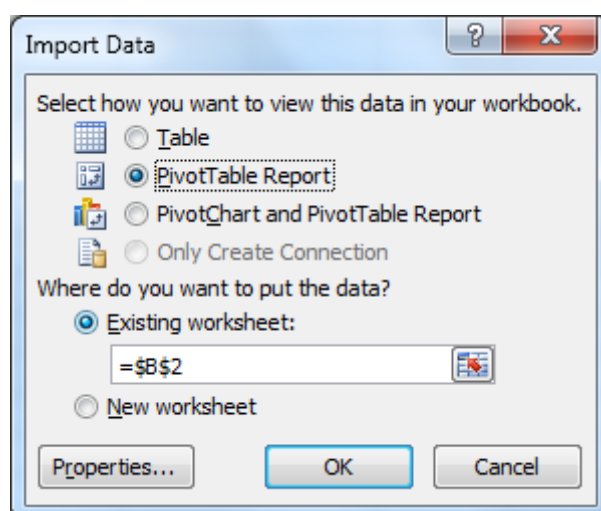
A Pivot Table is a way to present information in a report format. The idea is that the user can click drop down lists and change the data that is being displayed. This type of table can be dynamically connected to Access databases. Any change in the database and updating the access table can be immediately reflected in the Pivot table. The information to be summarized using the pivot table should be prepared in advance in the database as a query. Previous example about hull material is useful to illustrate the use of pivot tables. To make an external data query to an Access 2007 database table, follow these steps:

1. Click the From Access command button in the Get External Data group on the Data tab.
2. Excel opens the Select Data Source dialog box.
3. Select the Access database file containing the table / query you want to import, and then click Open.
4. The Select Table dialog box appears.
5. Select the name of the Access data query (to select the previous example select example 1) that you want to import into the worksheet and click OK.

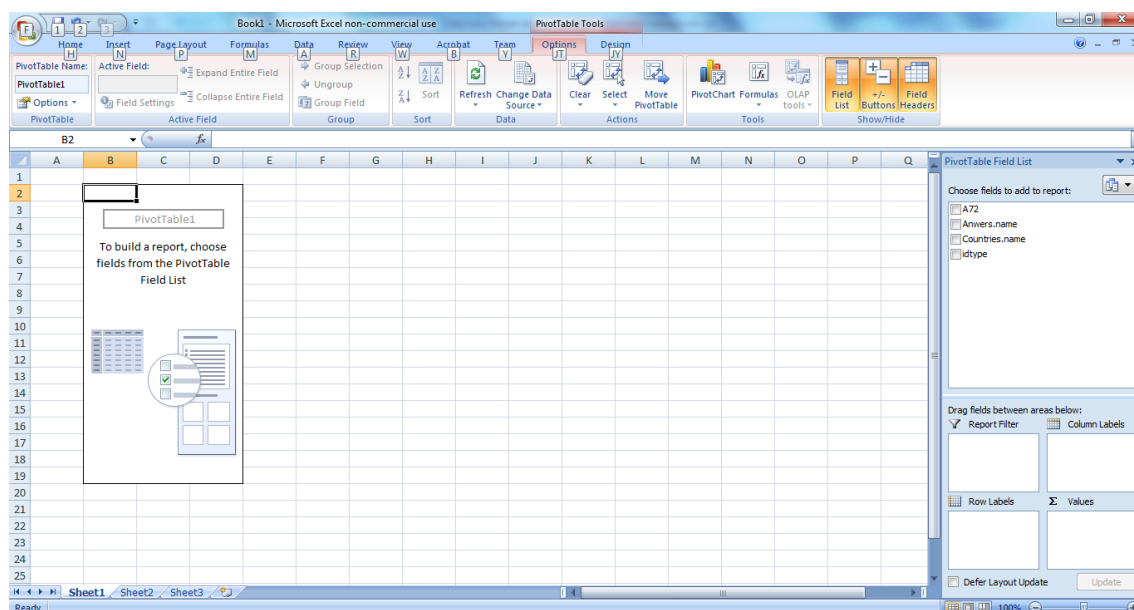




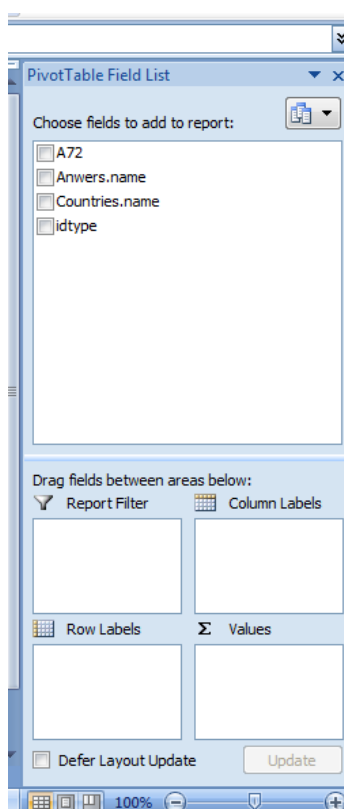
The Import Data dialog box appears.



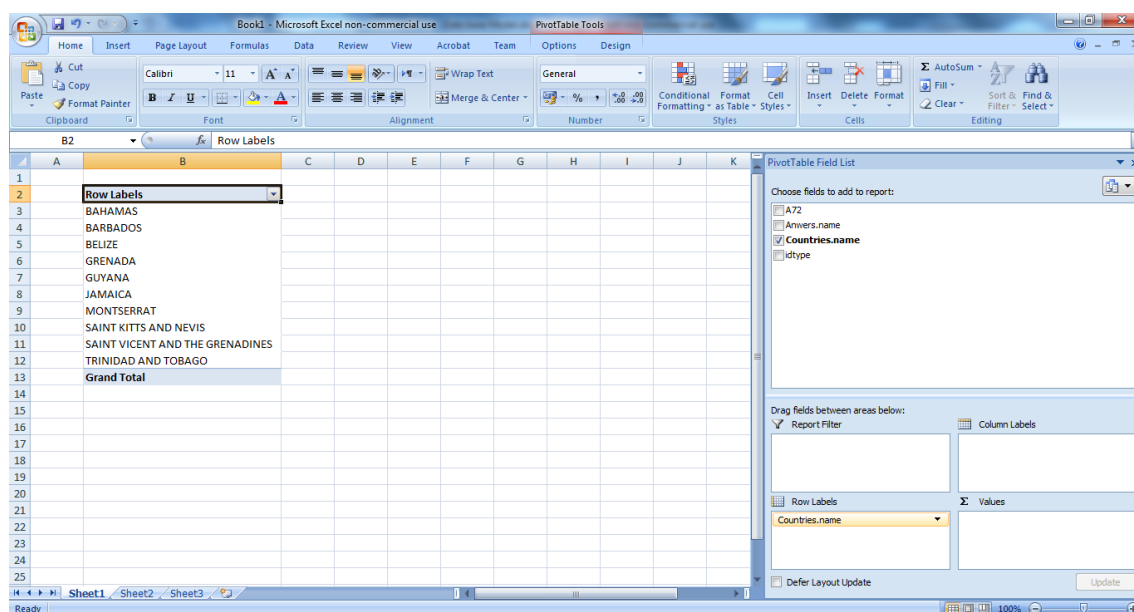
Select PivotTable Report and press OK button. A screen appears to design the pivot table.



On the right side of the screen there is an important element to build the table, the field list. Each field can be dragged from the list to one of the regions in the bottom (Column labels, row labels, values or report filter).

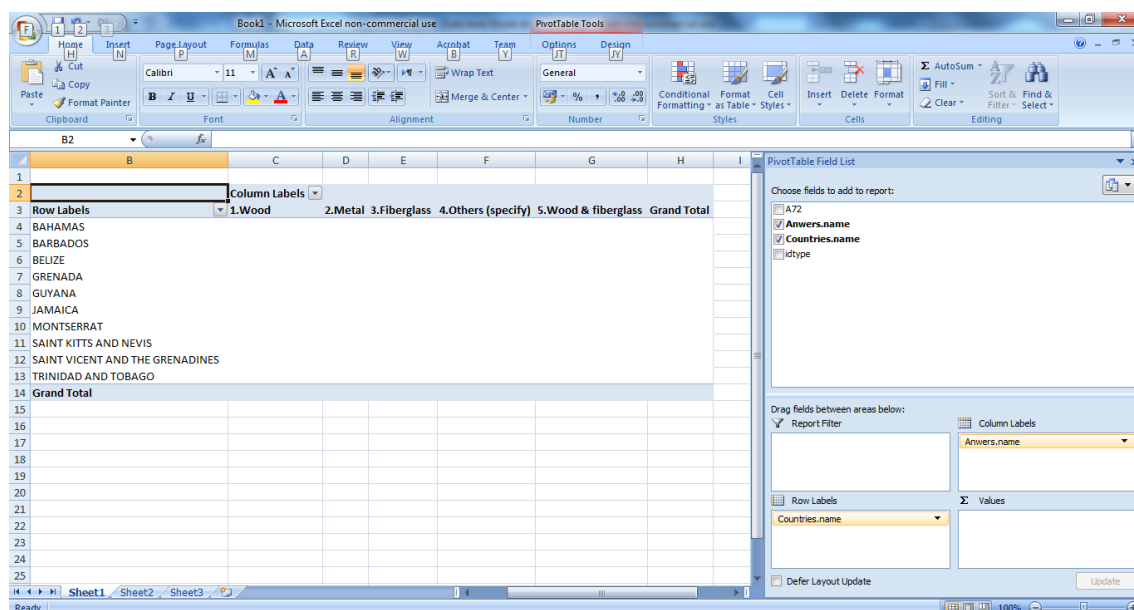


Drag the field Countries.name to row label section



In the excel sheet all the countries appears (10 countries in total).

It is possible to Drag “Answer.name” field to column labels an obtain all possible answers



To the value section any variable can be dragged because for this table the purpose is to count the number of different answers per country.

Book1 - Microsoft Excel non-commercial use

PivotTable Tools: Options, Design

Count of Countries.name

Count of Countries.name	1.Wood	2.Metal	3.Fiberglass	4.Others (specify)	5.Wood & fiberglass	Grand Total
BAHAMAS	1	1	101	1		104
BARBADOS	42		44			86
BELIZE	18		63			81
GRENADA	78		37	1	8	124
GUYANA	135	1				136
JAMAICA	19	1	318	3		341
MONTserrat	16		21	1	2	40
SAINT KITTS AND NEVIS	16		27		23	66
SAINT VICENT AND THE GRENADINES	39		31	2		72
TRINIDAD AND TOBAGO	2	2	115		3	122
Grand Total	366	5	757	8	36	1172

PivotTable Field List

Choose fields to add to report:

- ☐ A72
- ☒ Answers.name
- ☒ Countries.name
- ☐ dtype

Drag fields between areas below:

Report Filter:

Row Labels: Countries.name

Values: Count of Countries.name

Defer Layout Update: ☐

Update

To obtain column or row percentages click the field in value section and select value field settings.

Book1 - Microsoft Excel non-commercial use

PivotTable Tools: Options, Design

Count of Countries.name

Count of Countries.name	1.Wood	2.Metal	3.Fiberglass	4.Others (specify)	5.Wood & fiberglass	Grand Total
BAHAMAS	1	1	101	1		104
BARBADOS	42		44			86
BELIZE	18		63			81
GRENADA	78		37	1	8	124
GUYANA	135	1				136
JAMAICA	19	1	318	3		341
MONTserrat	16		21	1	2	40
SAINT KITTS AND NEVIS	16		27		23	66
SAINT VICENT AND THE GRENADINES	39		31	2		72
TRINIDAD AND TOBAGO	2	2	115		3	122
Grand Total	366	5	757	8	36	1172

PivotTable Field List

Choose fields to add to report:

- ☐ A72
- ☒ Answers.name
- ☒ Countries.name
- ☐ dtype

Drag fields between areas below:

Report Filter:

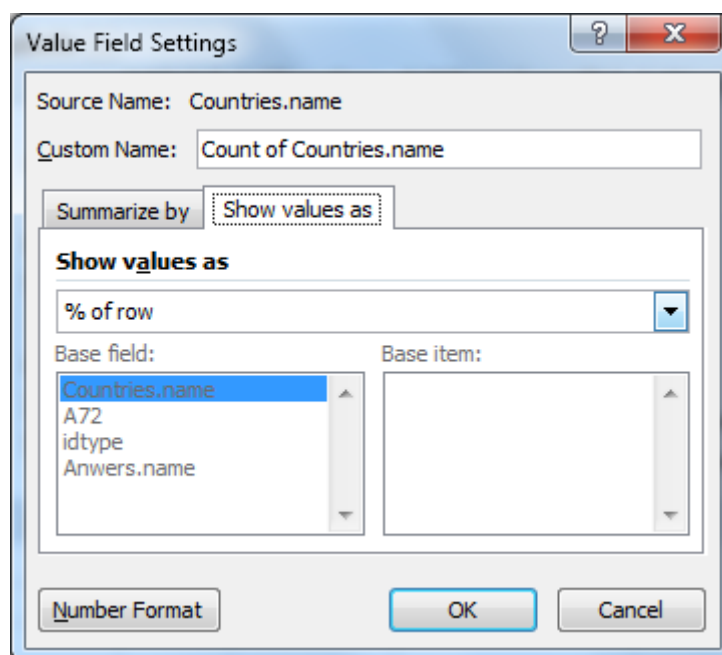
Row Labels: Countries.name

Values: Count of Countries.name

Field Settings...

Defer Layout Update: ☐

Update



In “Show value as” tab, select “% of row” option and press OK button.

Count of Countries.name	1.Wood	2.Metal	3.Fiberglass	4.Others (specify)	5.Wood & fiberglass	Grand Total
BAHAMAS	0,96%	0,96%	97,12%	0,96%	0,00%	100,00%
BARBADOS	48,84%	0,00%	51,16%	0,00%	0,00%	100,00%
BELIZE	22,22%	0,00%	77,78%	0,00%	0,00%	100,00%
GRENADA	62,90%	0,00%	29,84%	0,81%	6,45%	100,00%
GUYANA	99,26%	0,74%	0,00%	0,00%	0,00%	100,00%
JAMAICA	5,57%	0,29%	93,26%	0,88%	0,00%	100,00%
MONTserrat	40,00%	0,00%	52,50%	2,50%	5,00%	100,00%
SAINT KITTS AND NEVIS	24,24%	0,00%	40,91%	0,00%	34,85%	100,00%
SAINT VICENT AND THE GRENADINES	54,17%	0,00%	43,06%	2,78%	0,00%	100,00%
TRINIDAD AND TOBAGO	1,64%	1,64%	94,26%	0,00%	2,46%	100,00%
Grand Total	31,23%	0,43%			3,07%	100,00%

All the data appears as percentage of the row.

9.6 Advanced analysis. R

R is a programming environment for data analysis, calculation and graphics. In summary its main features are:

- data handling and storage facility;
- operators for matrix (and array) manipulation;
- data analysis tools;
- graphical facilities;
- a programming language

9.6.1 Download R

R is a freeware program that can be downloaded from:

<http://cran.r-project.org/bin/windows/base/>

Additionally to this program a lot of different modules can be downloaded depending of the analysis type. These modules can also be downloaded from r-project website.

9.6.2 Starting and quitting R

Once R is installed R program can be run just double click on the R icon. A new screen will appear containing one window (which lists information about the version number, license and getting started). The last line to appear will be '>', a standard prompt to indicate that R is expecting a command.

```
R : Copyright 2001, The R Development Core Team
Version 1.3.0 (2001-06-22)
R is free software and comes with ABSOLUTELY NO WARRANTY.
You are welcome to redistribute it under certain conditions.
Type 'license()' or 'licence()' for distribution details.
R is a collaborative project with many contributors.
Type 'contributors()' for more information.
Type 'demo()' for some demos, 'help()' for on-line help, or
'help.start()' for a HTML browser interface to help.
Type 'q()' to quit R.
>
```

To quit R, type q() followed by enter at the prompt:

```
> q()
```

Or directly close the R main window. A prompt asking whether to Save workspace will appear. Answering Yes will save all objects (variables) that were created during the session. Next time R is started from the same directory, the saved objects will be available for use.

9.6.3 On-line Help

The on-line help gives useful information. Getting used to using it and understanding the help will make it easier to use R. The on-line help can be accessed in HTML format by typing:

```
> help.start()
```

A keyword search is possible using the Search Engine and Keywords link. There is text help from within R using the function `help()` or `?t.test`. For example, the following two commands result in the same thing.

```
> help(t.test)
> ?t.test
```

To do a keyword search use the function `apropos()`. For example:

```
> apropos("test")
[1] "chisq.test" "print.htest" "prop.test" "t.test"
```

Note that you need to put the keyword in double quotes (“keyword”).

9.6.4 General comments

R is case sensitive. D and d are different symbols and refer to different variables. Similarly sag, Sag and SAG refer to three different variables.

R commands are separated by a semi-colon (;) or by a newline. To put comments in your code use a hash (#) and everything from the hash to the end of the line will be regarded as a comment.

If a command is not complete at the end of a line then R will issue the following prompt (by default):

```
+
```

On second and subsequent lines until the command syntax is correct. To break out this, type CTRL + c (press the Control Key and ‘C’ at the same time).

To recall a previously typed commands use the up arrow key ("). To go between previously typed commands use the up and down arrow (#) keys. Once a command is recalled, it can be modified/corrected using the left () and right arrow keys (!).

9.6.5 Maths in R

In this section R will be used to do simple arithmetic.

Whatever is typed at the prompt is evaluated, and the result is printed.

```

> 2+3      # Addition
[1] 5       # Answer labelled with [1]
> 2*4 + 7  # Multiplication and addition
[1] 15      # Multiplication first
> 10/3     # Division
[1] 3.333333
> 7^2      # Squaring ...
[1] 49
> 5**3     # ** to the power of...
[1] 125
> 5^3      # or we can use ^
[1] 125
> (56-12)/4 - 7*(84/12-3) # more complicated...
[1] -17

```

Standard functions that are found on a scientific calculator are available in R, for example:

```

> sqrt(2)      # Square root
[1] 1.414214
> sin(3.14159) # sin(Pi radians) is zero
[1] 2.65359e-06 # and this is close...
It also provides pi (π) as a constant.
> sin(pi)
[1] 1.224606e-16 # much closer to zero.

```

Here is a short list of some of the arithmetic functions in Splus:

Name	Operation
sqrt	square root
abs	absolute value
sin cos tan	trigonometric functions (radians)
asin acos atan	inverse trigonometric functions
sinh cosh tanh	hyperbolic functions
asinh acosh atanh	inverse hyperbolic functions
exp log	exponential and natural logarithm
log10	common logarithm
gamma lgamma	gamma function and its natural log

These functions can be nested and combined to make more complex expressions:

```

> sqrt(sin(45*pi/180))
[1] 0.8408964

```

9.6.6 Logical values

R enables computation with Boolean, or Logical variables. These take on either the value True or False. You can use conditional tests to generate these values:

```
> x <- 32
> x > 16 # Is x greater than 16?
[1] T # Yes it is (True).
> x <= 16 # Is x less than equal to 16?
[1] F # No it is not (False).
```

Logical values can be stored in variables in the same way as numeric values:

```
> tf <- x>16
> tf
[1] T
```

9.6.7 Managing Objects

To list the objects (e.g., variables, data, functions) that you have created simply type `ls()`. For example:

```
> height <- 1.78
> weight <- 83
> age <- 26
> job <- "Builder"
> ls()

[1] "age" "height" "job" "weight"
```

To search for objects which contain given characters, use the pattern option abbreviated to `pat`).

```
> ls(pat="h")
[1] "height" "weight"
To restrict the search to objects that start with this character, type:
> ls(pat="^h")
[1] "height"
```

To delete an object use the `rm()` functions.

```
> rm(age)
> ls()
[1] "height" "job" "weight"
```

9.6.8 Vectors

To create a simple vector, use the `c()` (combine function) function. Try:

```
> x <- c(2,4,6,10,11) A sequence of numbers.
> x To see the outcome...
[1] 2 4 6 10 11
```

It is possible to manipulate vectors in a similar manner to scalars. However care must be taken when doing such things as the results may not be the desired ones.


```
> x <- 12:1 # x is a sequence .....
> x
[1] 12 11 10 9 8 7 6 5 4 3 2 1
> x*2 # multiply x by 2 ...
[1] 24 22 20 18 16 14 12 10 8 6 4 2
> x*x # square x....
[1] 144 121 100 81 64 49 36 25 16 9 4 1
```

If the vectors are of different length we can get some strange answers for example try the following:

```
> x <- 1:10
> y <- c(1,3)
> x*y
[1] 1 6 3 12 5 18 7 24 9 30
```

It would appear as though the vectors have to be the same size to be multiplied, vector y has been repeated five times and then multiplied by x.

In this example the length of y is a factor of the length of x (type `length(x)` and `length(y)`). However if it is not a factor then a warning message is issued as follows:

```
> x <- 1:10
> y <- c(1,2,3)
> x + y

Warning in x + y : longer object length
is not a multiple of shorter object length
[1] 2 4 6 5 7 9 8 10 12 11
```

Note that the operation has been completed. Logical operations on a vector produce a vector of True and False values, for example:

```
> x > 5
[1] F F F F T T T T T
```

The extraction of an element can be done using square brackets [].

```
> x <- c(1:10)*2
> x
[1] 2 4 6 8 10 12 14 16 18 20
> x[6] # extracting the 6th value...
[1] 12 # which is 12
> x[2:6] # extracting values 2 through 6 inclusive.
[1] 4 6 8 10 12
> x[c(1,7,9)] # extracting the 1st, 7th and 9th values.
[1] 2 14 18
> y <- x[c(1,5,8)] # assigning a subset of x to y.
> y
[1] 2 10 16
```

```
> x[9:6] # reverse order...
[1] 18 16 14 12
> x[c(1:3, 8:10)] # two distinct ranges...
[1] 2 4 6 16 18 20
3 VECTORS 14
> x[c(1,2,3,1,2,3,1,2,3,1,2,3)] # repetition of the index...
[1] 2 4 6 2 4 6 2 4 6 2 4 6
> x[c(8,2,5,10)] # any order you please....
[1] 16 4 10 20
```

As mentioned above it is possible to assign subsets to a vector

```
> y <- x[c(1:4,3,9)]
> y
[1] 2 4 6 8 6 18
```

By using a negative subscript in the selection procedure, the corresponding numbered element is not included in the return vector.

```
> x <- c(3,6,9,12,15,18,21)
> x
[1] 3 6 9 12 15 18 21
> x[-4] # exclude the 4th element...
[1] 3 6 9 15 18 21
> x[c(-4,-6)] # exclude 4th and 6th elements...
[1] 3 6 9 15 21
```

Negative and positive numbers cannot be mixed.

```
> x[c(3,-4)]
Error: only 0's may mix with negative subscripts
```

Logical values can be used as subscripts. A True value selects that element, and a False value does not select

```
> x[x > 5]
[1] 6 7 8 9 10
```

This looks a bit strange to most people at first, seeing x inside a subscript of itself, but when you remember that `x > 5` is just a vector of True and False, it starts to make sense. There are functions that operate on vectors and return useful information:

```
> x <- 5:14
> length(x) # Number of elements in x
[1] 10
> max(x) # Largest value in x
[1] 14
> min(x) # Smallest value in x
```

```
[1] 5
> sum(x) # Sum of all the values in x
[1] 95
> prod(x) # The product of all the values in x
[1] 3632428800
> mean(x) # The mean of the all values in x
[1] 14.5
> range(x) # Range of vector x
[1] 5 14
> var(x) # The variance of x
[1] 35
> sd(x) # The standard deviation of x
[1] 3.027650
> sqrt(var(x)) # The square root of the variance (sd)
[1] 3.027650
```

Notice that `range(x)` produces a vector of length two, whereas the other functions produce a scalar. Arithmetic operations on logical values work with “True” being equal to one, and “False” being equal to zero. You can count the number of True values in a vector by using `sum(x)`.

```
> x <- 1:10
> x>7
[1] F F F F F F T T T
> sum(x>7)
[1] 3
```

This tells us there are three values in the vector `x` that are greater than 7. The following functions action on the whole vector.

```
> y <- c(-3.72, 11.56, 14.57, 19.65, -4.41, 15.41, 25.79, 6.21, 9.84, 12.92)
> round(y, 1) # Round y to one decimal place.
[1] -3.7 11.6 14.6 19.6 -4.4 15.4 25.8 6.2 9.8 12.9
> trunc(y) # Take the integer part of y.
[1] -3 11 14 19 -4 15 25 6 9 12
> ceiling(y) # Round up to the nearest integer.
[1] -3 12 15 20 -4 16 26 7 10 13
> rev(y) # Reverse the order of y.
[1] 12.92 9.84 6.21 25.79 15.41 -4.41 19.65 14.57 11.56 -3.72
> sort(y) # Sort y in increasing order.
[1] -4.41 -3.72 6.21 9.84 11.56 12.92 14.57 15.41 19.65 25.79
> rev(sort(y)) # Sort y in decreasing order.
[1] 25.79 19.65 15.41 14.57 12.92 11.56 9.84 6.21 -3.72 -4.41
> rank(y) # Rank elements of y.
[1] 2 5 7 9 1 8 10 3 4 6
> cumsum(y) # Calculate the cumulative sum of y.
[1] -3.72 7.84 22.41 42.06 37.65 53.06 78.85
[8] 85.06 94.90 107.82
> cumprod(y) # Calculate the cumulative product of y.
[1] -3.720000e+00 -4.300320e+01 -6.265566e+02 -1.231184e+04
```

```
[5] 5.429520e+04 8.366891e+05 2.157821e+07 1.340007e+08  
[9] 1.318567e+09 1.703588e+10
```

Missing values are coded as NA in R. For example:

```
> missx <- c(2, 5, 7, NA, 4, 5, 2)  
> missx  
[1] 2 5 7 NA 4 5 2  
> missx[2]  
[1] 5  
> missx[4]  
[1] NA
```

The fourth element of missx is missing. Statistical functions will return a missing value (NA) if a vector contains any missing values. To overcome this we have to use the na.rm=T option.

```
> median(missx)  
[1] NA  
> median(missx, na.rm=T)  
[1] 4.5  
> min(missx)  
[1] NA  
> min(missx, na.rm=T)  
[1] 2
```

9.6.9 Matrices

It is possible to store data in a two-dimensional matrix. Using matrix function:

```
> x <- matrix(c(2,3,5,7,11,13),ncol=2)  
> x  
[,1] [,2]  
[1,] 2 7  
[2,] 3 11  
[3,] 5 13
```

The matrix is composed by a vector of the values, and it is needed to specify either ncol or nrow to tell the function the size of the matrix.

The labels on the matrix rows and columns can be shown when printing a vector. They also provide information about how to extract parts of a matrix. Using square brackets with two comma-separated values:

```
> x[2,1] # One element of x  
[1] 3  
> x[2,2] # Another element  
[1] 11
```

By leaving out one number, is possible to get the whole row or column:

```
> x[,1] # The first column
[1] 2 3 5
> x[3,] # The third row
[1] 5 13
```

Notice that returning a single row or column produces a vector. sub-matrices can be extracted from a matrix by specifying a vector as one of the indices:

```
> x[2:3,] Rows 2 and 3
[1,] [,2]
[1,] 3 11
[2,] 5 13 labels start at 1 again
```

It is possible to specify a vector for the rows and columns subscripts to get a piece of the original matrix:

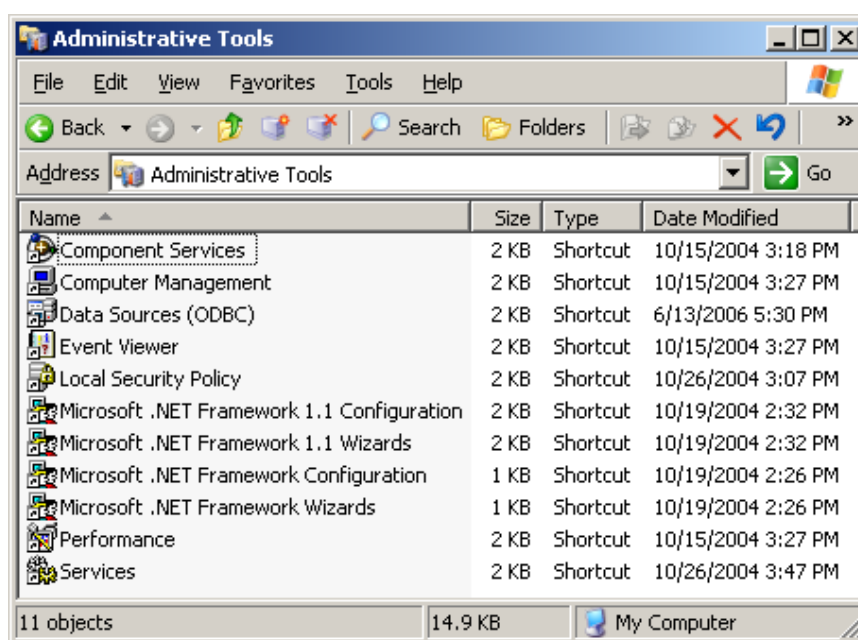
```
> x <- matrix(1:16,ncol=4)
> x
[1,] [,2] [,3] [,4]
[1,] 1 5 9 13
[2,] 2 6 10 14
[3,] 3 7 11 15
[4,] 4 8 12 16
> x[c(1,4),c(3,4)] Rows 1 and 4,
[1,] [,2] Cols 3 and 4
[1,] 9 13
[2,] 12 16
```

9.6.10 Data frames

A data frame is very much like a matrix, except it is designed for storing statistical or experimental data. Each row represents a unit, and each column a collection of measurements on the units. Each column can store a different type of data, such as numeric or character. The columns can also have names much like a list.

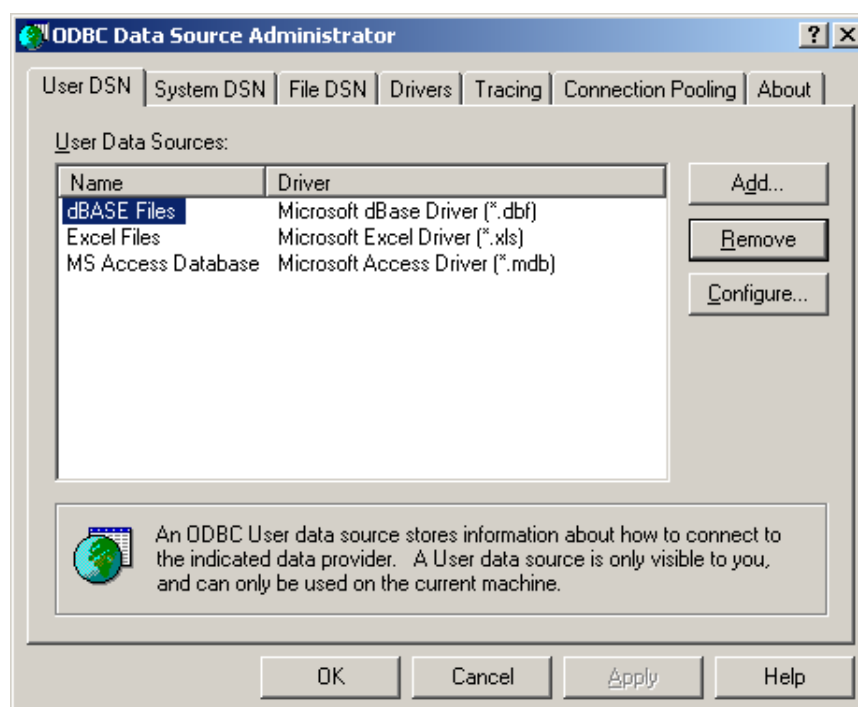
To process the data of the survey it was necessary to obtain the data frame from MS Access data base. To do that a special R module must be loaded to implement Database connectivity. This module is called RODBC. RODBC works with Windows ODBC and a new DSN must be created to access Survey database. To create this DSN the next steps must be followed:

1. Open Administrative tools from the control panel.



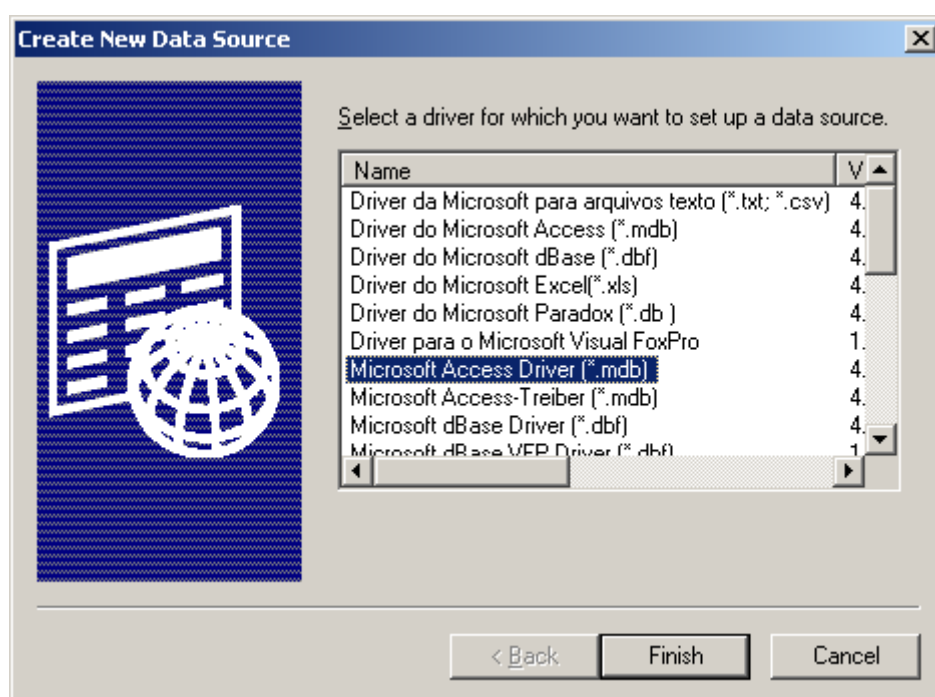
Administrative Tools Control Panel

2. Select Data Sources (ODBC) tool and press “add” button



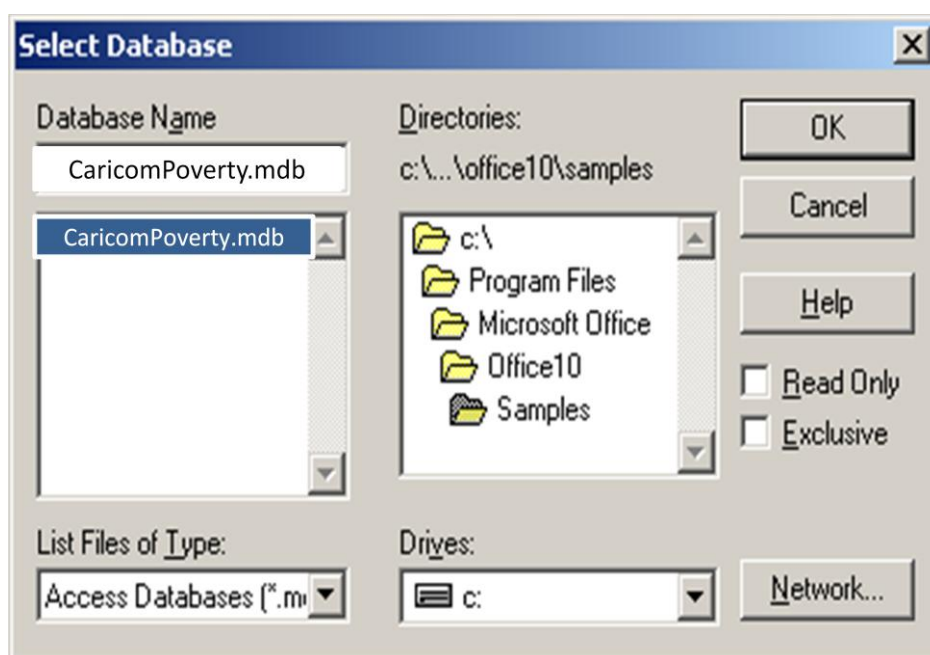
ODBC Data Source Administrator

3. Select Microsoft Access Driver.



Create New Data Source

4. Select the database.



Select Database

5. Name the DSN.



After the DSN is created, it is available to work with R program by loading RODBC module.

```
#Load RODBC Library.
library(RODBC)

#Open conection. DSN Caricom must exists in the machine
channel <- odbcConnect("CaricomPoverty")
```

Once the connection is established it is possible to perform a query and store the data in a matrix.

```
#Performance a query stored in MS ACCESS and save the data in matrix
Origin<-sqlFetch(channel, "Clustering_matrix_4v_regions")
```

In the example “Clustering_matrix_4V_regions” is a query of Survey Database. The dimension of the matrix is a 5x10, five columns and 10 rows.

```
> matrix
  Name                PromedioDeBN1      PromedioDeBN2
  PromedioDeBN3
1  BAHAMAS            -0.003115265      0.009345794
  0.009345794
2  BARBADOS           0.004385965      0.002631579
  0.021052632
3  BELIZE              0.131766382      0.029914530
  0.196581197
```

4	GRENADA	0.026170799	0.041322314
	0.041322314		
5	GUYANA	0.142424242	0.001515152
	0.109090909		
6	JAMAICA	0.084394904	0.058386412
	0.080679406		
7	MONTserrat	-0.033333333	0.025000000
	0.000000000		
8	SAINT KITTS AND NEVIS	0.000000000	0.010563380
	0.056338028		
9	SAINT VICENT AND THE GRE	0.011261261	0.020270270
	0.040540541		
10	TRINIDAD AND TOBAGO	-0.031456954	0.004966887
	0.079470199		
	PromedioDeBN4D		
1	0.01869159		
2	0.03157895		
3	0.17948718		
4	0.09090909		
5	0.36363636		
6	0.10191083		
7	0.02500000		
8	0.01408451		
9	0.10810811		
10	0.05960265		

A data frame can be built using the elements of the matrix and data.frame function.

```
> data<-data.frame(matrix[1],matrix[2],matrix[3],matrix[4],matrix[5],row.names="name")
```

Data variable is a dataframe and each row has been labeled with the name of the country.

> data		
	PromedioDeBN1	PromedioDeBN2
PromedioDeBN3		
BAHAMAS	-0.003115265	0.009345794
0.009345794		
BARBADOS	0.004385965	0.002631579
0.021052632		
BELIZE	0.131766382	0.029914530
0.196581197		
GRENADA	0.026170799	0.041322314
0.041322314		
GUYANA	0.142424242	0.001515152
0.109090909		
JAMAICA	0.084394904	0.058386412
0.080679406		

MONTSERRAT	-0.033333333	0.025000000
0.000000000		
SAINT KITTS AND NEVIS	0.000000000	0.010563380
0.056338028		
SAINT VICENT AND THE GRE	0.011261261	0.020270270
0.040540541		
TRINIDAD AND TOBAGO	-0.031456954	0.004966887
0.079470199		
	PromedioDeBN4D	
BAHAMAS	0.01869159	
BARBADOS	0.03157895	
BELIZE	0.17948718	
GRENADA	0.09090909	
GUYANA	0.36363636	
JAMAICA	0.10191083	
MONTSERRAT	0.02500000	
SAINT KITTS AND NEVIS	0.01408451	
SAINT VICENT AND THE GREN	0.10810811	
TRINIDAD AND TOBAGO	0.05960265	
>		

In certain studies to have a row label instead a variable is really useful, for example for clustering. In the clustering the country name is not relevant for data processing but is necessary to identify the final result.

9.6.11 Clustering

Cluster analysis classifies a set of observations into two or more mutually exclusive unknown groups based on combinations of interval variables. The purpose of cluster analysis is to discover a system of organizing observations into groups, where members of the groups share properties in common. It is cognitively easier for people to predict behavior or properties of people or objects based on group membership, all of whom share similar properties. It is generally cognitively difficult to deal with individuals and predict behavior or properties based on observations of other behaviors or properties.

Cluster analysis starts with a data matrix, where objects are rows and observations are columns. From this beginning, a table is constructed where objects are both rows and columns and the numbers in the table are measures of similarity or differences between the two observations.

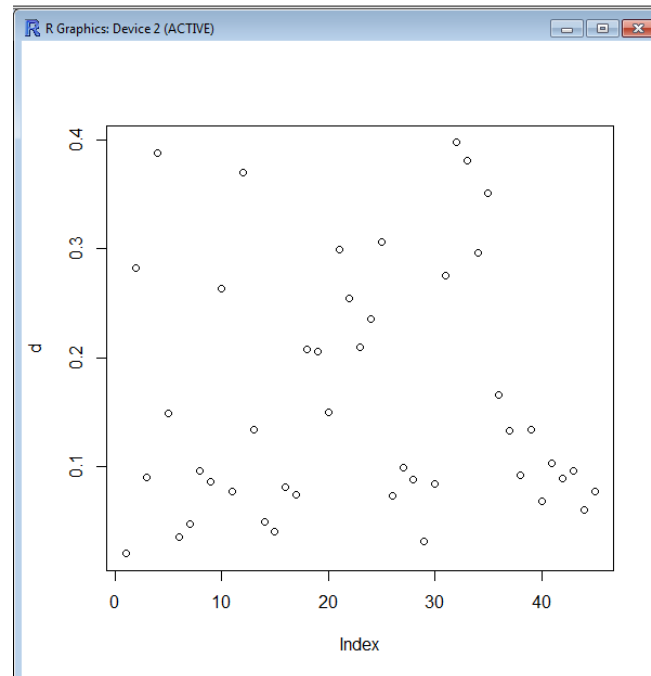
Using the function `dist` it is possible to obtain distance matrix:

```
#Distance matrix using euclidean method
>d <- dist(data, method = "euclidean")
```

In this example the data frame used in the previous example has been used to calculate distance matrix.

Distance matrix can be plotted using plot function

```
#plot distance  
>plot(d)
```

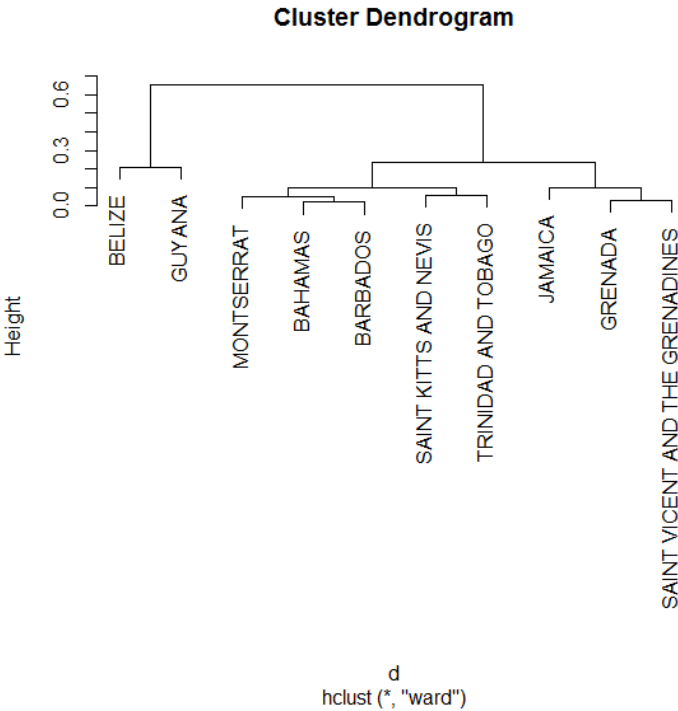


Using distance matrix is possible to calculate the clusters using different method. For example to obtain a dendrogram (hierarchical clustering) the function hclust can be used.

```
>fit <- hclust(d, method="ward")
```

By executing this command line the object fit contains the result of the cluster analysis. The Dendrogram is obtained by plotting the object fit.

```
> plot(fit)
```



APPENDIX III: Questionnaires



SURVEY TO DETERMINE POVERTY LEVELS IN FISHING COMMUNITIES IN THE CARICOM REGION

HOUSEHOLD - AQUACULTURE QUESTIONNAIRE

Nature, characteristics and purpose of the questionnaire

The main goal is to measure the social and economic status of fishing communities in the countries of the CARICOM region. The study will encompass different geographical and sector levels in order to make a relative comparison of the data obtained.

Another basic goal is to measure poverty, this being understood as a socioeconomic situation characterised by a clear lack of satisfaction in respect of basic needs.

Confidentiality of the information

The individual data obtained for statistical purposes is of a private nature. As such, no individual information of any kind may be provided; nor may it be used for any purpose that is not strictly statistical. Only numerical summaries, overall grouped data and, in general, impersonal data will be provided.

OBSERVATIONS

<p>Questionnaire Identification</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border: 1px solid black; width: 20px; height: 20px;"></td> <td style="border: 1px solid black; width: 20px; height: 20px;"></td> <td style="border: 1px solid black; width: 20px; height: 20px;"></td> <td style="border: 1px solid black; width: 20px; height: 20px;"></td> <td style="border: 1px solid black; width: 20px; height: 20px;"></td> <td style="border: 1px solid black; width: 20px; height: 20px;"></td> </tr> <tr> <td style="text-align: center; font-size: 8px;">No. Interviewee</td> <td style="text-align: center; font-size: 8px;">Country Code</td> <td style="text-align: center; font-size: 8px;">Survey Code</td> <td colspan="3"></td> </tr> </table> <p>AQ Questionnaire:</p> <p style="text-align: center;">_____ of _____</p>							No. Interviewee	Country Code	Survey Code				<p>Name of interviewer: _____</p> <p>Date of the interview: _____</p>									
No. Interviewee	Country Code	Survey Code																				
<table style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left; font-weight: normal;">Country Code</th> <th style="text-align: left; font-weight: normal;">Survey Code</th> </tr> <tr> <td style="vertical-align: top;"> <table style="width: 100%;"> <tr><td>01 BAHAMAS</td><td>06 JAMAICA</td></tr> <tr><td>02 BARBADOS</td><td>07 MONTSERRAT</td></tr> <tr><td>03 BELIZE</td><td>08 SAINT KITTS AND NEVIS</td></tr> <tr><td>04 GRENADA</td><td>09 SAINT VINCENT AND THE GRENADINES</td></tr> <tr><td>05 GUYANA</td><td>10 TRINIDAD AND TOBAGO</td></tr> </table> </td> <td style="vertical-align: top;"> <table style="width: 100%;"> <tr><td>FS Fisherman</td></tr> <tr><td>AQ Aquaculture</td></tr> <tr><td>PI Processing Industry</td></tr> </table> </td> </tr> </table>						Country Code	Survey Code	<table style="width: 100%;"> <tr><td>01 BAHAMAS</td><td>06 JAMAICA</td></tr> <tr><td>02 BARBADOS</td><td>07 MONTSERRAT</td></tr> <tr><td>03 BELIZE</td><td>08 SAINT KITTS AND NEVIS</td></tr> <tr><td>04 GRENADA</td><td>09 SAINT VINCENT AND THE GRENADINES</td></tr> <tr><td>05 GUYANA</td><td>10 TRINIDAD AND TOBAGO</td></tr> </table>	01 BAHAMAS	06 JAMAICA	02 BARBADOS	07 MONTSERRAT	03 BELIZE	08 SAINT KITTS AND NEVIS	04 GRENADA	09 SAINT VINCENT AND THE GRENADINES	05 GUYANA	10 TRINIDAD AND TOBAGO	<table style="width: 100%;"> <tr><td>FS Fisherman</td></tr> <tr><td>AQ Aquaculture</td></tr> <tr><td>PI Processing Industry</td></tr> </table>	FS Fisherman	AQ Aquaculture	PI Processing Industry
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FS Fisherman																						
AQ Aquaculture																						
PI Processing Industry																						

AQUACULTURE QUESTIONNAIRE	
(A) IDENTIFICATION AND PLANNING	
1	Name of owner/manager: <input type="text"/>
Farm/facility details:	
	Name <input type="text"/>
	Address <input type="text"/>
2	Telephone/Fax <input type="text"/>
	E-mail <input type="text"/>
	Website <input type="text"/>
	Date of establishment <input type="text"/>
3	<div> Please indicate your main current sources of financing <div> <input type="checkbox"/> National bank loans <input type="checkbox"/> Partnership <input type="checkbox"/> Savings <input type="checkbox"/> Governmental assistance <input type="checkbox"/> Foreign investment <input type="checkbox"/> International cooperation </div> </div>
4	Do you intend to wind up operations in the near future? Yes <input type="checkbox"/> No <input type="checkbox"/>
5	Do you intend to invest in the enlargement/modernisation/ improvement of your farm/facility in the near future? Yes <input type="checkbox"/> No <input type="checkbox"/>
6	If so, please specify your enlargement/modernisation/improvement plans <input type="text"/>
(B) STRUCTURE AND ACTIVITY	
7	<div> Type of aquaculture activity <div> <input type="checkbox"/> Mariculture <input type="checkbox"/> Aquaculture, brackish water <input type="checkbox"/> Aquaculture, freshwater </div> </div>
8	<div> Use of production <div> <input type="checkbox"/> Production <input type="checkbox"/> Transformation <input type="checkbox"/> Restocking <input type="checkbox"/> Ornamental </div> </div>
9	<div> Level of exploitation <div> <input type="checkbox"/> Extensive cultivation <input type="checkbox"/> Semi-intensive cultivation <input type="checkbox"/> Intensive cultivation </div> </div>
10	<div> Scale of production <div> <input type="checkbox"/> Large scale <input type="checkbox"/> Medium scale <input type="checkbox"/> Small scale <input type="checkbox"/> Subsistence </div> </div>

11	Type of culture/facilities	<input type="checkbox"/> Cages <input type="checkbox"/> Tanks <input type="checkbox"/> Raceways <input type="checkbox"/> Ponds <input type="checkbox"/> Lines/Rafts <input type="checkbox"/> Mangroves <input type="checkbox"/> Others (specify) <input type="text"/>				
12	Stages that are carried out	<input type="checkbox"/> 1. Spawning (reproduction) <input type="checkbox"/> 2. Hatchery <input type="checkbox"/> 3. Nursery <input type="checkbox"/> 4. Fattening to commercial size <input type="checkbox"/> 5. Brood stock				
13	Do you carry out any other activity?	<input type="checkbox"/> Processing <input type="checkbox"/> Packaging <input type="checkbox"/> Distribution <input type="checkbox"/> Others (specify) <input type="text"/>				
14	Production					
	Species (common name)	Scientific name (to be filled by interviewer)	Stages (question 11)	Fattening Area (acres)	Volume (mt) ² /year	Value/year
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
* In the case of ornamental fish, indicate the number of individuals produced						
15	Is your farm/facility operating at full capacity?			Yes <input type="checkbox"/>	No <input type="checkbox"/>	
16	If not, indicate at what percentage of its capacity it is operating:			<input type="text"/>		
17	Are you the owner of the land where the farm/facility is located?			Yes <input type="checkbox"/>	No <input type="checkbox"/>	
18	Do you have any government concession regarding the use of the land?			Yes <input type="checkbox"/>	No <input type="checkbox"/>	

(C) ECONOMIC INFORMATION				
Income (in national currency):				
	Day	Week	Month	Amount
19 Sales	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Subsidies / Donations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Other income	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Costs (in national currency):				
	Day	Week	Month	Amount
Eggs and young fish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Food	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Containers and packaging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Other supplies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Rentals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Mortgage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Amortization of tangible fixed assets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
20 Repairs and maintenance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Transport	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Water supplies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Other supplies (fuel, electricity, gas...)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Staff costs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
National Social Security contribution	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Quality assurance system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Security	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Other costs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Taxes (in national currency):				
	Day	Week	Month	Amount
21 Type of tax	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Financial result (in national currency):				
	Day	Week	Month	Amount
22 Profit(+) of the activity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
	Day	Week	Month	Amount
Loss(-) of the activity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>

(D) MARKETING									
23	How does the marketing take place?	<input type="checkbox"/> Without intermediary agents <input type="checkbox"/> Directly to retailers <input type="checkbox"/> Directly to wholesalers <input type="checkbox"/> Others (specify) <input type="text"/> <input type="text"/>							
24	Destination of the production								
		Percentage %							
	Restocking	<input type="text"/>							
	Own consumption	<input type="text"/>							
	Local market	<input type="text"/>							
	National market	<input type="text"/>							
	Regional export	<input type="text"/>							
	International export	<input type="text"/>							
25	Does your farm/facility offer constant supply?						Yes <input type="checkbox"/>	No <input type="checkbox"/>	
26	Do you import aquaculture products?						Yes <input type="checkbox"/>	No <input type="checkbox"/>	
27	Which?	<input type="text"/>							
		<input type="text"/>							
		<input type="text"/>							
		<input type="text"/>							
		<input type="text"/>							
(E) EMPLOYMENT AND TRAINING									
28	Full-time employment								
		Women				Men			
		No.	Hours/ day	Days/ month	Salary/ month	No.	Hours/ day	Days/ month	Salary/ month
	Non-salaried staff								
	Professional workers								
	Skilled workers								
	Middle services workers								
	Semi-skilled workers								
	Unskilled workers								
	Others (please, specify)								
	<input type="text"/>								
	<input type="text"/>								
<input type="text"/>									

Part-time employment									
		Women			Men				
		No.	Hours/ day	Days/ month	Salary/ month	No.	Hours/ day	Days/ month	Salary/ month
29	Non-salaried staff								
	Professional workers								
	Skilled workers								
	Middle services workers								
	Semi-skilled workers								
	Unskilled workers								
	Others (please, specify)								
30	Indicate in which months of the year you employ part-time staff	<input type="checkbox"/> January <input type="checkbox"/> February <input type="checkbox"/> March <input type="checkbox"/> April			<input type="checkbox"/> May <input type="checkbox"/> June <input type="checkbox"/> July <input type="checkbox"/> August			<input type="checkbox"/> September <input type="checkbox"/> October <input type="checkbox"/> November <input type="checkbox"/> December	
31	If part-time staff employment is seasonally adjusted, which are the reasons?	<input type="checkbox"/> Seasonal production <input type="checkbox"/> Seasonal demand <input type="checkbox"/> Seasonal work (specify) <input type="text"/> <input type="checkbox"/> Others (specify) <input type="text"/>							
32	Does your farm/facility provide its staff with any type of training?	Yes <input type="checkbox"/> No <input type="checkbox"/>							
33	If so, what type of training does your farm/facility provide?	<input type="text"/>							

(F) SOCIAL BENEFITS		
34	Is your farm/facility covered by insurance of any kind?	Yes <input type="checkbox"/> No <input type="checkbox"/> DK/NA <input type="checkbox"/>
35	Have you received any training related to the aquaculture sector in the last five (5) years?	Yes <input type="checkbox"/> No <input type="checkbox"/> DK/NA <input type="checkbox"/>
36	Have you received any government subsidy in the last five (5) years?	Yes <input type="checkbox"/> No <input type="checkbox"/> DK/NA <input type="checkbox"/>
37	Have you received any non-governmental financial assistance in the last five (5) years?	Yes <input type="checkbox"/> No <input type="checkbox"/> DK/NA <input type="checkbox"/>
38	Are you participating in a social security system?	Yes <input type="checkbox"/> No <input type="checkbox"/>
39	Do you belong to a cooperative/association?	Yes <input type="checkbox"/> No <input type="checkbox"/>
40	If so, what services does it provide you with?	<div> <input type="checkbox"/> Marketing <input type="checkbox"/> Supply of fry/fingerling/feed <input type="checkbox"/> Supply of materials <input type="checkbox"/> Energy supply (fuel, electricity, water...) <input type="checkbox"/> Preservation facilities <input type="checkbox"/> Warehouse facilities <input type="checkbox"/> Legal guidance <input type="checkbox"/> Education <input type="checkbox"/> Others (indicate which) <div style="border: 1px solid black; height: 40px; width: 100%; margin-top: 5px;"></div> </div>
41	Do you think that cooperatives/associations work well?	Yes <input type="checkbox"/> No <input type="checkbox"/> DK/NA <input type="checkbox"/>
(G) FISHERY POLICY		
42	Are you familiar with your country's aquaculture development plans?	Yes <input type="checkbox"/> No <input type="checkbox"/> DK/NA <input type="checkbox"/>
43	Are you familiar with the laws/regulations that govern the aquaculture sector in your country?	No, never <input type="checkbox"/> Sometimes <input type="checkbox"/> Yes, always <input type="checkbox"/>
44	Are you or the cooperative/association that you belong to consulted as part of decision-making and planning processes?	No, never <input type="checkbox"/> Sometimes <input type="checkbox"/> Yes, always <input type="checkbox"/>
(H) ENVIRONMENTAL INFORMATION		
45	Mark which water supply source you use	<div> <input type="checkbox"/> Sea <input type="checkbox"/> River <input type="checkbox"/> Estuary <input type="checkbox"/> Reservoir <input type="checkbox"/> Well/spring <input type="checkbox"/> National supply system <input type="checkbox"/> Irrigation system <input type="checkbox"/> Rainwater <input type="checkbox"/> Others (indicate) <div style="border: 1px solid black; height: 40px; width: 100%; margin-top: 5px;"></div> </div>
46	Do you have aeration systems?	Yes <input type="checkbox"/> No <input type="checkbox"/>
47	Do you use filters?	Yes <input type="checkbox"/> No <input type="checkbox"/>

48	Do you carry out water recirculation?	Yes <input type="checkbox"/>	No <input type="checkbox"/>			
49	Do you carry out wastewater treatment?	Yes <input type="checkbox"/>	No <input type="checkbox"/>			
Score the importance of the following environmental aspects for the running of your farm/facility:						
		1	2	3	4	5
	Location	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Quality of the water supply source	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Quality of the water in the facility	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Water use permits	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
50	Wastewater	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Feeding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Use of chemical / biological products	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Others (specify):					
	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Score: 1= not at all important; 2= not very important; 3= neutral; 4= important; 5= very important

(I) MAIN PROBLEMS						
Score the importance of the following obstacles/problems in terms of keeping your business running						
		1	2	3	4	5
	Bureaucratic problems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Difficulty in gaining access to electricity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Difficulty in gaining access to water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Low quality of water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Supply problems (feeds, young fish, larvae)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Other supplies (generators, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Natural disasters (hurricanes, floods, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
51	Invading species, diseases, etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Difficulties in finding specialised staff	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Difficulties in gaining access to loans	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Difficulties in gaining access to the market/marketing of the product	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Difficulties in distribution/transport of the product	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Praedial larceny	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Fulfilment of environmental requirements (e.g. EIAs)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Others (please specify):					
	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Score: 1= not at all important; 2= not very important; 3= neutral; 4= important; 5= very important

(J) DEVELOPMENT ACTIONS					
Score the importance that the following aquaculture sector development actions would have in your farm/facility					
	1	2	3	4	5
Locating of zones and possibilities for the development of aquaculture	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Development and transfer of technology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Improvements in health control and product quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Speeding up of administrative procedures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Promotion of the consumption of aquaculture products	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Promotion of market opportunities for aquaculture products	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Promotion of producers' organizations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Improvement or distribution/transport of aquaculture products	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Control of food and water quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Promotion of investment in aquaculture	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Training of specialised technicians	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Boosting of R&D&i	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reduction of negative impacts on the environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Design and implementation of an action plan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Others (please specify):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Score: 1= not at all Important; 2= not very Important; 3= neutral; 4= Important; 5= very Important

HOUSEHOLD QUESTIONNAIRE

(A) IDENTIFICATION

Identification details of the interviewee

1. Name (optional): _____
2. District / Island / County / Parish: _____
3. Community / Village: _____
4. Country of birth: _____
5. Length of time living in the Community: _____
6. If you have been living in this community for less than 5 years, which Community do you come from? _____
7. If you have moved from another geographical area, how many of your family members moved with you? _____

(B) HOUSEHOLD COMPOSITION AND CHARACTERISTICS OF FAMILY MEMBERS

Members of Household Table

1. Order No.	2. He/She is...	3. Shares Income with Household (YES / NO)	4. Civil status	5. Sex 1. M 2. F	6. Age	7. Education level (choose highest)	8. How many years of the highest level have you completed?	9. Does he/she have any disability or illness?	10. In respect of economic activity, what was his/her situation last month?
1									
INTERVIEWEE									
2									
3									
4									
5									
6									
7									
8									
9									
10									

CODES

2. He/She is:

- 01 Wife / Husband
- 02 Father/ Mother-(in-law)
- 03 Son / Daughter
- 04 Brother/ Sister-(in-law)
- 05 Other relatives
- 06 Domestic service
- 07 Lodger
- 08 Guest

4. CIVIL status

- 01 Single
- 02 Married
- 03 Widower/Widow
- 04 Separated
- 05 Divorced
- 06 Common law

6. Age (years)

- 01 Less than 15
- 02 15 to 25
- 03 26 to 35
- 04 36 to 45
- 05 46 to 55
- 06 56 to 65
- 07 More than 65

7. Educational level

- 01 Illiterate
- 02 Semiliterate
- 03 Basic or primary education
- 04 Secondary education
- 05 Tertiary education

9. Disability

- 01 No disability or illness
- 02 Minor
- 03 Medium grade
- 04 Severe

10. Relationship with economic activity

- 01 Employed
- 02 With work but temporarily absent (due to illness, holidays...)
- 03 Unemployed, seeking work
- 04 Retired
- 05 Student
- 06 At home carrying out domestic chores
- 07 Other situation without economic activity

(C) HOME INCOME FROM THE WHOLE MEMBERS (IN NATIONAL CURRENCY)

1. Activity branch	2. Household Income	3. Income periodicity - 1 = Daily - 2 = Weekly - 3 = Monthly - 4 = Annual - 5 = Occasional	4. Months in which income is obtained	5. Income from the activity used for SELF CONSUMPTION (YES / NO)	6. Estimated value of portion used for SELF CONSUMPTION if purchased in the market
A. FISHERY			<input type="checkbox"/> All year J F M A M J J A S O N D		
B. Agriculture, cattle raising and forestry			<input type="checkbox"/> All year J F M A M J J A S O N D		
C. Exploitation of mines and quarries			<input type="checkbox"/> All year J F M A M J J A S O N D		
D. Manufacturing Industries			<input type="checkbox"/> All year J F M A M J J A S O N D		
E. Services (businesses, hotels, restaurants...)			<input type="checkbox"/> All year J F M A M J J A S O N D		
F. Transport, warehousing and communications			<input type="checkbox"/> All year J F M A M J J A S O N D		
G. Civil servant			<input type="checkbox"/> All year J F M A M J J A S O N D		
H. Training			<input type="checkbox"/> All year J F M A M J J A S O N D		
I. Tourism			<input type="checkbox"/> All year J F M A M J J A S O N D		
J. Others			<input type="checkbox"/> All year J F M A M J J A S O N D		
Remittances			<input type="checkbox"/> All year J F M A M J J A S O N D		

(D) ACTIVITY IN THE FISHERY SECTOR

1. Order No. (from Members of Household Table)	2. Professional situation	3. Daily hours worked	4. No. of days worked per week	5. Indicate if there are several members who participate together in the same activity	6. Indicate the type of fishery activity carried out

CODES**2. Professional situation**

- 01 Employed worker
- 02 Business owner without salaried workers or independent worker
- 03 Employer or Skipper
- 04 Unpaid family member (helps out in the business or company...)
- 05 Other situation (specify)

6. Types of fishery activity

- 01 Catches
- 02 Aquaculture production
- 03 Processing
- 04 Marketing
- 05 Gear construction and repairs/maintenance
- 06 Vessel construction and repairs/maintenance
- 07 Others

(E) DWELLING DATA																																																																
1. What is the tenancy status of your main dwelling? 1. Own dwelling, fully paid <input type="checkbox"/> 2. Own dwelling, paying mortgage <input type="checkbox"/> 3. Rented <input type="checkbox"/> 4. Provided, partly free of charge <input type="checkbox"/> 5. Provided, entirely free of charge <input type="checkbox"/> 6. Other (specify) <input type="checkbox"/>					2. If you are not in rented accommodation, what monthly rent would you have to pay for a similar dwelling? <div style="display: flex; justify-content: space-between;"> <div>Estimated monthly rent</div> <div>Value <input type="text"/></div> <div>Currency <input type="text"/></div> </div>																																																											
3. How many rooms does this dwelling have? (excluding toilet, kitchen and garage) <input type="text"/>					<input type="text"/>																																																											
4. What is this dwelling's surface area? (Indicate measurement units) <input type="text"/>					<input type="text"/>																																																											
5. Do the members of your household have access to the following services and/or facilities:																																																																
	In their own Home	In their own Community	Outside the community	Incidence of Service																																																												
Toilet				Never	Rarely	Often	Very often																																																									
Latrine																																																																
Running water																																																																
Electricity																																																																
Kitchen																																																																
Lavatory																																																																
Shower/ Bath																																																																
Telephone																																																																
Drainage system for sewage removal																																																																
6. For cooking you mainly use: 1. Firewood <input type="checkbox"/> 2. Gas <input type="checkbox"/> 3. Coal <input type="checkbox"/> 4. Electricity <input type="checkbox"/> 5. Kerosene, alcohol <input type="checkbox"/> 6. Others <input type="checkbox"/> 7. None, does not cook <input type="checkbox"/>																																																																
7. How do you normally remove garbage? 1. By burning it <input type="checkbox"/> 2. It is collected by a garbage truck <input type="checkbox"/> 3. It is thrown into a pit <input type="checkbox"/> 4. It is thrown into a ditch, street or patio <input type="checkbox"/> 5. It is used as manure/composting <input type="checkbox"/> 6. It is thrown into a stream, river, lagoon or the sea <input type="checkbox"/> 7. Other <input type="checkbox"/>																																																																
8. Construction material (see codes): (more than one may be indicated) <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>A. Exterior walls</th> <th>B. Floor</th> <th>C. Roof</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </tbody> </table>										A. Exterior walls	B. Floor	C. Roof	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																	
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9. Desirable dwelling improvements: (more than one may be indicated) <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>A. Facade</th> <th>D. Plasterwork</th> <th>G. Flooring</th> <th>J. Air conditioning</th> </tr> <tr> <th>B. Insulation</th> <th>E. Windows</th> <th>H. Roof</th> <th>K. Others</th> </tr> <tr> <th>C. Kitchen</th> <th>F. Structure</th> <th>I. W.C.</th> <th></th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </tbody> </table>										A. Facade	D. Plasterwork	G. Flooring	J. Air conditioning	B. Insulation	E. Windows	H. Roof	K. Others	C. Kitchen	F. Structure	I. W.C.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																							
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<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																													
10. What type of dwelling does this household occupy Undivided private house <input type="checkbox"/> Flat/Apartment/Condominium <input type="checkbox"/> Tenement <input type="checkbox"/> Compound <input type="checkbox"/> Others (specify) <input type="checkbox"/>					11. Would you prefer to live in another type of dwelling? YES <input type="checkbox"/> NO <input type="checkbox"/>																																																											
12. Are you the owner of the land? YES <input type="checkbox"/> NO <input type="checkbox"/>																																																																
13. Equipment: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2"></th> <th colspan="2">A. Do you have...</th> <th colspan="2">B. Would you like to have one?</th> <th colspan="2">C. Can you afford it?</th> </tr> <tr> <th>YES</th> <th>NO</th> <th>YES</th> <th>NO</th> <th>YES</th> <th>NO</th> </tr> </thead> <tbody> <tr> <td>1. Landline phone</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>2. Mobile phone</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>3. TV</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>4. Washing machine</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>5. Fridge</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>6. Motor vehicle</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </tbody> </table>											A. Do you have...		B. Would you like to have one?		C. Can you afford it?		YES	NO	YES	NO	YES	NO	1. Landline phone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2. Mobile phone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3. TV	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4. Washing machine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5. Fridge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6. Motor vehicle	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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(F) ACQUISITION OF GOODS AND SERVICES**HOUSEHOLD EXPENDITURES (IN NATIONAL CURRENCY)**

Item	2. Weekly amount	3. Monthly amount	4. Yearly amount
1. Food and beverages			
2. Clothing and footwear			
3. Furniture, home equipment and home maintenance expenditures			

Dwelling

4. Rent			
5. Mortgage			
6. Water			
7. Electricity			
8. Gas or other fuels			
9. Garbage taxes			
10. Landline phone			
11. Mobile phone			
12. Internet			
13. TV fees			
14. Home insurance			
15. Domestic service			
16. Other services for the dwelling			

Transport

17. Private transport cost			
18. Public transport costs (train, bus, boat...)			

Health

19. Doctor			
20. Medicines			
21. Hospitals			
22. Other medical costs			

Education

23. Primary education			
24. Secondary education			
25. Tertiary education			
26. School meals			
27. School transport			
28. Accommodation service			
29. Other educational costs			

Leisure

30. Leisure costs (shows, culture...)			
31. Betting, gambling			

Others

32. Consultancy, legal and funeral service costs			
33. Illness insurance costs...			

2. In your opinion, what minimum monthly net income would you need in order to make ends meet in a household like yours?

1. You manage to save money _____ ☐
2. You can just about balance your income and outgoings _____ ☐
3. You are forced to spend your savings _____ ☐
4. You are forced into debt _____ ☐

Net monthly income

Value

Currency

3. In the last 5 years, has your household been affected by any of the following problems?

- | | | |
|----------------------|-------|--------------------------|
| 1. Earthquakes | _____ | <input type="checkbox"/> |
| 2. Floods | _____ | <input type="checkbox"/> |
| 3. Hurricanes | _____ | <input type="checkbox"/> |
| 4. Fires | _____ | <input type="checkbox"/> |
| 5. Others (Indicate) | _____ | <input type="checkbox"/> |

4. If you have indicated any of the situations in question 3, how have you managed to sort out the problems in your household?

1. Using money from your savings or investments _____ ☐
2. Getting into debt or getting a mortgage _____ ☐
3. Selling goods (houses, cars, land...) _____ ☐
4. In kind services _____ ☐
5. Selling jewellery, domestic appliances, furniture _____ ☐
6. You received money from relatives or friends _____ ☐
7. You obtained loans from your workplace _____ ☐
8. The insurance company paid out _____ ☐
9. You received government assistance _____ ☐
10. You received assistance from the church or NGOs _____ ☐
11. You worked more _____ ☐
12. Other household members began to work _____ ☐
13. You reduced food costs _____ ☐
14. You reduced health or education costs _____ ☐

5. Urgent needs of the neighbourhood:

- A. Electricity
B. Public transport
C. Health centre
D. Asphalting

- E. Rubbish collection
- F. Drainage network
- G. Public school
- H. Gas

- I. Running water
- J. Water-treatment plant
- K. Garbage dump
- L. Others

8. Compared with 5 years ago, would you say that you are economically:

1. Better off _____ ☐
2. The same _____ ☐
3. Worse off _____ ☐

7. Do you have access to loans for financing income-generating fisheries activities?

1. Yes ☐
2. No ☐

8. Have you ever received loans for these income-generating fisheries activities?

1. Yes, but not enough ☐
2. Yes, enough ☐
3. No ☐ ➔ Go to 11

8. Purpose of loan

10. Source of loan

- | | | |
|--|-------|--------------------------|
| 1. Loan institutions | _____ | <input type="checkbox"/> |
| 2. Non-profit interest loans from private individuals | _____ | <input type="checkbox"/> |
| 3. Loans with profitable interest from private individuals | _____ | <input type="checkbox"/> |

11. In the last 5 years, have you invested any or all of your savings in improvements related to your fisheries activities?

1. Yes ☐ Indicate which _____
2. No ☐

12. Are you thinking of investing in improvements related to your fisheries activities within the next 5 years?

1. Yes ☐ { Will you request a loan? ☐
Will you use savings? ☐ Indicate which improvements: _____
2. No ☐



SURVEY TO DETERMINE POVERTY LEVELS IN FISHING COMMUNITIES IN THE CARICOM REGION

HOUSEHOLD – FISHERMAN QUESTIONNAIRE

Nature, characteristics and purpose of the questionnaire

The main goal is to measure the social and economic status of fishing communities in the countries of the CARICOM region. The study will encompass different geographical and sector levels in order to make a relative comparison of the data obtained.

Another basic goal is to measure poverty, this being understood as a socioeconomic situation characterised by a clear lack of satisfaction in respect of basic needs.

Confidentiality of the information

The individual data obtained for statistical purposes is of a private nature. As such, no individual information of any kind may be provided; nor may it be used for any purpose that is not strictly statistical. Only numerical summaries, overall grouped data and, in general, impersonal data will be provided.

OBSERVATIONS

Questionnaire Identification			Name of interviewer: _____	
<input type="text"/>	<input type="text"/>	<input type="text"/>	Date of the interview: _____	
No. Interviewee	Country Code	Survey Code		
FS Questionnaire: _____ of _____				
Country Code 01 BAHAMAS 06 JAMAICA 02 BARBADOS 07 MONTSERRAT 03 BELIZE 08 SAINT KITTS AND NEVIS 04 GRENADA 09 SAINT VINCENT AND THE GRENADINES 05 GUYANA 10 TRINIDAD AND TOBAGO			Survey Code FS Fisherman AQ Aquaculture PI Processing Industry	

FISHERMAN QUESTIONNAIRE						
(A) IDENTIFICATION AND EQUIPMENT						
1	Are you a boat owner?				Yes <input type="checkbox"/> No <input type="checkbox"/>	
2	Are you a boat agent?				Yes <input type="checkbox"/> No <input type="checkbox"/>	
3	Are you renting the boat?				Yes <input type="checkbox"/> No <input type="checkbox"/>	
4	Are you part of the crew?				Yes <input type="checkbox"/> No <input type="checkbox"/>	
5	Name of the boat that you own/manage/rent or on which you work:		<input type="text"/>			
6	External mark or registration number:		<input type="text"/>			
What are the characteristics of the boat that you own/operate/work on?						
		Type of boat (write the appropriate code as indicated in the manual)	<input type="text"/>			
		Hull Material	<input type="checkbox"/> Wood <input type="checkbox"/> Metal (aluminium, steel, etc.) <input type="checkbox"/> Fiberglass <input type="checkbox"/> Others (specify) <input type="text"/>			
7	Age (years)		<input type="text"/>			
	Length		<input type="text"/>	unit	<input type="text"/>	
	Breadth		<input type="text"/>	unit	<input type="text"/>	
	Engine power		<input type="text"/>	<input type="checkbox"/> KW <input type="checkbox"/> HP		
	Crew (No. people)		<input type="text"/>			
	Cost at time of purchase (boat + equipment)		<input type="text"/>			
	Cost of a new unit (boat + equipment)		<input type="text"/>			
What types of fishing gear do you use?						
Pots/Traps		<input type="checkbox"/>	Handline	<input type="checkbox"/>	Trawl nets	<input type="checkbox"/>
Hookstick		<input type="checkbox"/>	Hawaiian sling	<input type="checkbox"/>	Scuba diving	<input type="checkbox"/>
Spearguns		<input type="checkbox"/>	Encircling nets/ Beach seines	<input type="checkbox"/>	Others	<input type="checkbox"/>
Longline		<input type="checkbox"/>	Gill nets	<input type="checkbox"/>	<input type="text"/>	
(B) DEDICATION						
9	How long have you been working in the profession?:				<input type="text"/>	
10	How long (hours) does it take you to reach the fishing ground/zone?				<input type="text"/>	
11	How long do you spend on fishing operations within a fishing trip?				<input type="text"/>	

(C) FISHING ACTIVITIES INCOMES				
On average, what is the daily catch of your boat?				
12		Low season	High season	Unit
	In weight	<input type="text"/>	<input type="text"/>	<input type="text"/>
	In value (national currency)	<input type="text"/>	<input type="text"/>	<input type="text"/>
On average, what is the weekly catch of your boat?				
13		Low season	High season	Unit
	In weight	<input type="text"/>	<input type="text"/>	<input type="text"/>
	In value (national currency)	<input type="text"/>	<input type="text"/>	<input type="text"/>
(D) FISHING ACTIVITIES EXPENDITURES				
Boat costs (in national currency):				
		Day	Week	Month
	Fuel	<input type="text"/>	<input type="text"/>	<input type="text"/>
	Oil	<input type="text"/>	<input type="text"/>	<input type="text"/>
	Ice	<input type="text"/>	<input type="text"/>	<input type="text"/>
	Bait	<input type="text"/>	<input type="text"/>	<input type="text"/>
14	Annual licences			<input type="text"/>
	Annual insurance			<input type="text"/>
	Wages	<input type="text"/>	<input type="text"/>	<input type="text"/>
	Annual boat repair and maintenance costs			<input type="text"/>
	Annual engine repair and maintenance costs			<input type="text"/>
	Annual repair and maintenance costs of fishing gears			<input type="text"/>
	Cooperative/association fees		<input type="text"/>	<input type="text"/>
	Market taxes	<input type="text"/>	<input type="text"/>	<input type="text"/>
	Others:	<input type="text"/>	<input type="text"/>	<input type="text"/>
	15	If you are a boat owner, do you usually require financing to meet the costs of your fishing expeditions (fuel and/or provisions for the crew)?	<input type="checkbox"/> Yes, always <input type="checkbox"/> Mostly	<input type="checkbox"/> Not very often <input type="checkbox"/> No, never
(E) POST HARVEST TREATMENT AND MARKETING				
16	Do you unload catches in your fishing community?	<input type="checkbox"/> Yes, always <input type="checkbox"/> Mostly	<input type="checkbox"/> Not very often <input type="checkbox"/> No, never	
17	Do you sell your fishing products in your fishing community?	<input type="checkbox"/> Yes, always <input type="checkbox"/> Mostly	<input type="checkbox"/> Not very often <input type="checkbox"/> No, never	
18	Average number of days that pass between unloading a catch and selling it	<input type="text"/>		
19	Approximate percentage of fishing products spoiled without being consumed or sold and its potential value	<input type="text"/> % value <input type="text"/>		
20	Do you process your fishing products in any way?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Sometimes <input type="checkbox"/>

21	If so, please indicate which process	<input type="checkbox"/> Dried <input type="checkbox"/> Smoked <input type="checkbox"/> Salted <input type="checkbox"/> Peeled <input type="checkbox"/> Others (specify)	<input type="checkbox"/> Gutted <input type="checkbox"/> Headed <input type="checkbox"/> Tailed <input type="text"/>	
22	List the main species that you catch:			
	Low season			
	Main species	Scientific name (to be filled by interviewer)	First sale price	Vendors price
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
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	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
	23	High season		
		Main species	Scientific name (to be filled by interviewer)	First sale price
<input type="text"/>		<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>		<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>		<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>		<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>		<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>		<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>		<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>		<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>		<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>		<input type="text"/>	<input type="text"/>	<input type="text"/>
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<input type="text"/>		<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>		<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>		<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>		<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>		<input type="text"/>	<input type="text"/>	<input type="text"/>
23		Main marketing problems	<input type="checkbox"/> Low price of fish <input type="checkbox"/> Low demand <input type="checkbox"/> Lack of handling/preservation facilities <input type="checkbox"/> Lack of an adequate market <input type="checkbox"/> Others, please specify	<input type="text"/>

(F) SOCIAL BENEFITS		
24	Have you received any training related to the fishery sector in the last five (5) years?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> DK/NA
25	If so, what type?	<input type="checkbox"/> Risks and onboard safety <input type="checkbox"/> Food handling, health and hygiene <input type="checkbox"/> Aquaculture techniques <input type="checkbox"/> Boat skipper <input type="checkbox"/> Company administration <input type="checkbox"/> Fishing techniques <input type="checkbox"/> Processing and marketing <input type="checkbox"/> Others (specify) <input type="text"/>
26	Have you received any government subsidy in the last five (5) years?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> DK/NA
27	Have you received any non-governmental financial assistance in the last 5 years?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> DK/NA
28	How do you receive payment?	<input type="checkbox"/> Fixed wage <input type="checkbox"/> On a share basis <input type="checkbox"/> In kind reward <input type="checkbox"/> Without remuneration
29	Are you participating in a social security system?	<input type="checkbox"/> Yes <input type="checkbox"/> No
30	Do you belong to a fisher's cooperative/association?	<input type="checkbox"/> Yes <input type="checkbox"/> No
31	If you belong to a fisher's cooperative/ association, what services do they provide you with?	<input type="checkbox"/> Marketing <input type="checkbox"/> Supply of fuel/gas <input type="checkbox"/> Supply of materials <input type="checkbox"/> Warehousing facilities <input type="checkbox"/> Preservation facilities <input type="checkbox"/> Legal advice <input type="checkbox"/> Education <input type="checkbox"/> Others (specify) <input type="text"/>
32	In general terms, do you think that fisher's cooperatives/association work well?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> DK/NA
(G) FISHERY POLICY		
33	Are you familiar with your country's fishery policy or fisheries management plans?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> DK/NA
34	Are you familiar with the laws/regulations that govern the fishing sector in your country?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> DK/NA

35	Are you or the cooperative/association that you belong to consulted as part of decision-making and planning processes?	<input type="checkbox"/> No, never <input type="checkbox"/> Sometimes <input type="checkbox"/> Yes, always
(H) ENVIRONMENTAL INFORMATION		
Have you observed in recent years...		
	A reduction in catches?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> DK/NA
	A reduction in the size of the species that are caught?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> DK/NA
36	If you state that changes have taken place, what might be the cause of these changes?	<input type="checkbox"/> Industrial pollution <input type="checkbox"/> Urban pollution <input type="checkbox"/> Pollution from construction on the sea shore <input type="checkbox"/> Pollution from agriculture / mining <input type="checkbox"/> Pollution from aquaculture farms <input type="checkbox"/> Overfishing <input type="checkbox"/> Climate change <input type="checkbox"/> Natural disasters <input type="checkbox"/> Deterioration/destruction of habitats (mangrove swamps, reefs...) <input type="checkbox"/> Tourism <input type="checkbox"/> Recreational fishing <input type="checkbox"/> Industrial fishing <input type="checkbox"/> Illegal fishing <input type="checkbox"/> Inexperienced fishermen <input type="checkbox"/> Others (specify) _____
37	Do you change fishing ground/zone periodically?	<input type="checkbox"/> No, never <input type="checkbox"/> Yes, once or twice a year <input type="checkbox"/> Yes, three or four times a year <input type="checkbox"/> Yes more than four times a year
38	If you do change fishing ground/zone, why?	<input type="checkbox"/> Closed season <input type="checkbox"/> Low catches <input type="checkbox"/> Change in target species <input type="checkbox"/> Others, please specify _____
39	Are you aware of the concept of marine protected areas?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> DK/NA
40	What impact do you think marine protected areas have on fishing?	<input type="checkbox"/> A negative one <input type="checkbox"/> A positive one <input type="checkbox"/> DK/NA <input type="checkbox"/> No impact at all
41	Are you in favour of creating more marine protected areas in your country?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> I don't care

(I) MAIN PROBLEMS			
42	Do you have problems regarding fishing grounds/zones?	<input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> DK/NA
43	Do you have problems regarding infrastructures for unloading?	<input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> DK/NA
44	Do you have problems meeting your supply and maintenance needs?	<input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> DK/NA
45	Do you have any problems regarding coastguards?	<input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> DK/NA
46	Do you have problems regarding artisanal fishermen?	<input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> DK/NA
47	Do you have problems regarding industrial fishermen?	<input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> DK/NA
48	Do you have problems regarding recreational fishermen?	<input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> DK/NA
49	If you are the owner, do you have problems finding a crew?	<input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Depends on the time of year
50	Other problems (please describe)		

HOUSEHOLD QUESTIONNAIRE

(A) IDENTIFICATION

Identification details of the interviewee

1. Name (optional): _____
2. District / Island / County / Parish: _____
3. Community / Village: _____
4. Country of birth: _____
5. Length of time living in the Community: _____
6. If you have been living in this community for less than 5 years, which Community do you come from? _____
7. If you have moved from another geographical area, how many of your family members moved with you? _____

(B) HOUSEHOLD COMPOSITION AND CHARACTERISTICS OF FAMILY MEMBERS

Members of Household Table

1. Order No.	2. He/She is...	3. Shares Income with Household (YES / NO)	4. Civil status	5. Sex 1. M 2. F	6. Age	7. Education level (choose highest)	8. How many years of the highest level have you completed?	9. Does he/she have any disability or illness?	10. In respect of economic activity, what was his/her situation last month?
1	INTERVIEWEE								
2									
3									
4									
5									
6									
7									
8									
9									
10									

CODES

2. He/She is:	4. CIVIL status	6. Age (years)	7. Educational level
01 Wife / Husband	01 Single	01 Less than 15	01 Illiterate
02 Father/ Mother-(in-law)	02 Married	02 15 to 25	02 Semiliterate
03 Son / Daughter	03 Widower/Widow	03 26 to 35	03 Basic or primary education
04 Brother/ Sister-(in-law)	04 Separated	04 36 to 45	04 Secondary education
05 Other relatives	05 Divorced	05 46 to 55	05 Tertiary education
06 Domestic service	06 Common law	06 56 to 65	
07 Lodger		07 More than 65	
08 Guest			
9. Disability	10. Relationship with economic activity		
01 No disability or illness	01 Employed		
02 Minor	02 With work but temporarily absent (due to illness, holidays...)		
03 Medium grade	03 Unemployed, seeking work		
04 Severe	04 Retired		
	05 Student		
	06 At home carrying out domestic chores		
	07 Other situation without economic activity		

(C) HOME INCOME FROM THE WHOLE MEMBERS (IN NATIONAL CURRENCY)

1. Activity branch	2. Household Income	3. Income periodicity - 1 = Daily - 2 = Weekly - 3 = Monthly - 4 = Annual - 5 = Occasional	4. Months in which income is obtained	5. Income from the activity used for SELF CONSUMPTION (YES / NO)	6. Estimated value of portion used for SELF CONSUMPTION if purchased in the market
A. FISHERY			<input type="checkbox"/> All year J F M A M J J A S O N D		
B. Agriculture, cattle raising and forestry			<input type="checkbox"/> All year J F M A M J J A S O N D		
C. Exploitation of mines and quarries			<input type="checkbox"/> All year J F M A M J J A S O N D		
D. Manufacturing Industries			<input type="checkbox"/> All year J F M A M J J A S O N D		
E. Services (businesses, hotels, restaurants...)			<input type="checkbox"/> All year J F M A M J J A S O N D		
F. Transport, warehousing and communications			<input type="checkbox"/> All year J F M A M J J A S O N D		
G. Civil Servant			<input type="checkbox"/> All year J F M A M J J A S O N D		
H. Training			<input type="checkbox"/> All year J F M A M J J A S O N D		
I. Tourism			<input type="checkbox"/> All year J F M A M J J A S O N D		
J. Others			<input type="checkbox"/> All year J F M A M J J A S O N D		
Remittances			<input type="checkbox"/> All year J F M A M J J A S O N D		

(D) ACTIVITY IN THE FISHERY SECTOR

1. Order No. (from Members of Household Table)	2. Professional situation	3. Daily hours worked	4. No. of days worked per week	5. Indicate if there are several members who participate together in the same activity	6. Indicate the type of fishery activity carried out

CODES**2. Professional situation**

- 01 Employed worker
- 02 Business owner without salaried workers or independent worker
- 03 Employer or Skipper
- 04 Unpaid family member (helps out in the business or company...)
- 05 Other situation (specify)

6. Types of fishery activity

- 01 Catches
- 02 Aquaculture production
- 03 Processing
- 04 Marketing
- 05 Gear construction and repairs/maintenance
- 06 Vessel construction and repairs/maintenance
- 07 Others

(E) DWELLING DATA									
1. What is the tenancy status of your main dwelling?					2. If you are not in rented accommodation, what monthly rent would you have to pay for a similar dwelling?				
1. Own dwelling, fully paid <input type="checkbox"/> 2. Own dwelling, paying mortgage <input type="checkbox"/> 3. Rented <input type="checkbox"/> 4. Provided, partly free of charge <input type="checkbox"/> 5. Provided, entirely free of charge <input type="checkbox"/> 6. Other (specify) <input type="checkbox"/>					Value <input type="text"/> Currency <input type="text"/> Estimated monthly rent <input type="text"/>				
3. How many rooms does this dwelling have? (excluding toilet, kitchen and garage) <input type="text"/>									
4. What is this dwelling's surface area? (Indicate measurement units) <input type="text"/>									
5. Do the members of your household have access to the following services and/or facilities:									
	In their own Home	In their own Community	Outside the community	Incidence of Service					
Toilet				Never	Rarely	Often	Very often		
Latrine									
Running water									
Electricity									
Kitchen									
Lavatory									
Shower/ Bath									
Telephone									
Drainage system for sewage removal									
6. For cooking you mainly use:					7. How do you normally remove garbage?				
1. Firewood <input type="checkbox"/> 2. Gas <input type="checkbox"/> 3. Coal <input type="checkbox"/> 4. Electricity <input type="checkbox"/> 5. Kerosene, alcohol <input type="checkbox"/> 6. Others <input type="checkbox"/> 7. None, does not cook <input type="checkbox"/>					1. By burning it <input type="checkbox"/> 2. It is collected by a garbage truck <input type="checkbox"/> 3. It is thrown into a pit <input type="checkbox"/> 4. It is thrown into a ditch, street or patio <input type="checkbox"/> 5. It is used as manure/composting <input type="checkbox"/> 6. It is thrown into a stream, river, lagoon or the sea <input type="checkbox"/> 7. Other <input type="checkbox"/>				
8. Construction material (see codes): (more than one may be indicated)					A. Exterior walls <input type="checkbox"/> B. Floor <input type="checkbox"/> C. Roof <input type="checkbox"/> D. Plasterwork <input type="checkbox"/> E. Windows <input type="checkbox"/> F. Structure <input type="checkbox"/> G. Flooring <input type="checkbox"/> H. Roof <input type="checkbox"/> I. W.C. <input type="checkbox"/> J. Air conditioning <input type="checkbox"/> K. Others <input type="checkbox"/>				
9. Desirable dwelling improvements: (more than one may be indicated)									
10. What type of dwelling does this household occupy					11. Would you prefer to live in another type of dwelling?				
Undivided private house <input type="checkbox"/> Flat/Apartment/Condominium <input type="checkbox"/> Tenement <input type="checkbox"/> Compound <input type="checkbox"/> Others (specify) <input type="checkbox"/>					YES <input type="checkbox"/> NO <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/>				
12. Are you the owner of the land?									
YES <input type="checkbox"/>					NO <input type="checkbox"/>				
13. Equipment:									
	A. Do you have...		B. Would you like to have one?		C. Can you afford it?				
	YES	NO	YES	NO	YES	NO			
1. Landline phone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
2. Mobile phone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
3. TV.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
4. Washing machine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
5. Fridge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
6. Motor vehicle	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
CODES: Construction Materials									
A. Exterior Walls			B. Floor			C. Roof			
01 Brick			01 Soil			01 Roof tiles			
02 Wood			02 Brick			02 Hollow blocks			
03 Waste materials			03 Common floor tiles			03 Cement			
04 Earthen			04 Cement			04 Zinc sheeting			
05 Cement block			05 Mosaic, ceramic, granite, marble			05 Wooden board			
06 Palm tree trunks			06 Wooden board			06 Reinforced concrete, earthware or clay block			
07 Cardboard, oilskin, packaging wood			07 Laminated board			07 Palm tree trunk			
08 Others			08 Others			08 Cardboard, oilskin, packaging wood			
						09 Others			

(F) ACQUISITION OF GOODS AND SERVICES**HOUSEHOLD EXPENDITURES (IN NATIONAL CURRENCY)**

Item	2. Weekly amount	3. Monthly amount	4. Yearly amount
1. Food and beverages			
2. Clothing and footwear			
3. Furniture, home equipment and home maintenance expenditures			

Dwelling

4. Rent			
5. Mortgage			
6. Water			
7. Electricity			
8. Gas or other fuels			
9. Garbage taxes			
10. Landline phone			
11. Mobile phone			
12. Internet			
13. TV fees			
14. Home insurance			
15. Domestic service			
16. Other services for the dwelling			

Transport

17. Private transport cost			
18. Public transport costs (train, bus, boat...)			

Health

19. Doctor			
20. Medicines			
21. Hospitals			
22. Other medical costs			

Education

23. Primary education			
24. Secondary education			
25. Tertiary education			
26. School meals			
27. School transport			
28. Accommodation service			
29. Other educational costs			

Leisure

30. Leisure costs (shows, culture...)			
31. Betting, gambling			

Others

32. Consultancy, legal and funeral service costs			
33. Illness insurance costs...			

2. In your opinion, what minimum monthly net income would you need in order to make ends meet in a household like yours?

- | | Value | Currency |
|--------------------|-------|----------|
| Net monthly income | | |

3. In the last 5 years, has your household been affected by any of the following problems?

1. Earthquakes _____ ☐
2. Floods _____ ☐
3. Hurricanes _____ ☐
4. Fires _____ ☐
5. Others (Indicate) _____ ☐

4. If you have indicated any of the situations in question 3, how have you managed to sort out the problems in your household?

1. Using money from your savings or investments _____ ☐
2. Getting into debt or getting a mortgage _____ ☐
3. Selling goods (houses, cars, land...) _____ ☐
4. In kind services _____ ☐
5. Selling jewellery, domestic appliances, furniture _____ ☐
6. You received money from relatives or friends _____ ☐
7. You obtained loans from your workplace _____ ☐
8. The insurance company paid out _____ ☐
9. You received government assistance _____ ☐
10. You received assistance from the church or NGOs _____ ☐
11. You worked more _____ ☐
12. Other household members began to work _____ ☐
13. You reduced food costs _____ ☐
14. You reduced health or education costs _____ ☐

5. Urgent needs of the neighbourhood:

- | | | | | | |
|---------------------|--------------------------|-----------------------|--------------------------|--------------------------|--------------------------|
| A. Electricity | <input type="checkbox"/> | E. Rubbish collection | <input type="checkbox"/> | I. Running water | <input type="checkbox"/> |
| B. Public transport | <input type="checkbox"/> | F. Drainage network | <input type="checkbox"/> | J. Water-treatment plant | <input type="checkbox"/> |
| C. Health centre | <input type="checkbox"/> | G. Public school | <input type="checkbox"/> | K. Garbage dump | <input type="checkbox"/> |
| D. Asphaltting | <input type="checkbox"/> | H. Gas | <input type="checkbox"/> | L. Others | <input type="checkbox"/> |

8. Compared with 5 years ago, would you say that you are economically:

1. Better off _____ ☐
2. The same _____ ☐
3. Worse off _____ ☐

7. Do you have access to loans for financing income-generating fisheries activities?

1. Yes ☐
2. No ☐

8. Have you ever received loans for these income-generating fisheries activities?

1. Yes, but not enough ☐
2. Yes, enough ☐
3. No ☐ ➔ Go to 11

8. Purpose of loan

10. Source of loan

- | | | |
|--|--|--------------------------|
| 1. Loan institutions | | <input type="checkbox"/> |
| 2. Non-profit interest loans from private individuals | | <input type="checkbox"/> |
| 3. Loans with profitable interest from private individuals | | <input type="checkbox"/> |

11. In the last 5 years, have you invested any or all of your savings in improvements related to your fisheries activities?

1. Yes ☐ Indicate which _____
2. No ☐ _____

12. Are you thinking of investing in improvements related to your fisheries activities within the next 5 years?

1. Yes ☐ { Will you request a loan? ☐
Will you use savings? ☐ Indicate which improvements: _____
2. No ☐



SURVEY TO DETERMINE POVERTY LEVELS IN FISHING COMMUNITIES IN THE CARICOM REGION

HOUSEHOLD - PROCESSING INDUSTRY QUESTIONNAIRE

Nature, characteristics and purpose of the questionnaire

The main goal is to measure the social and economic status of fishing communities in the countries of the CARICOM region. The study will encompass different geographical and sector levels in order to make a relative comparison of the data obtained.

Another basic goal is to measure poverty, this being understood as a socioeconomic situation characterised by a clear lack of satisfaction in respect of basic needs.

Confidentiality of the information

The individual data obtained for statistical purposes is of a private nature. As such, no individual information of any kind may be provided; nor may it be used for any purpose that is not strictly statistical. Only numerical summaries, overall grouped data and, in general, impersonal data will be provided.

OBSERVATIONS

Questionnaire Identification			Name of Interviewer: _____	
No. Interviewee	Country Code	Survey Code	Date of the Interview: _____	
PI Questionnaire: _____ of _____				
Country Code 01 BAHAMAS 06 JAMAICA 02 BARBADOS 07 MONTSERRAT 03 BELIZE 08 SAINT KITTS AND NEVIS 04 GRENADA 09 SAINT VINCENT AND THE GRENADINES 05 GUYANA 10 TRINIDAD AND TOBAGO			Survey Code FS Fisherman AQ Aquaculture PI Processing Industry	

PROCESSING INDUSTRY QUESTIONNAIRE	
(A) IDENTIFICATION AND PLANNING	
1	Name of owner/manager: <input type="text"/>
Company details:	
	Name <input type="text"/>
	Address <input type="text"/>
2	Telephone/Fax <input type="text"/>
	E-mail <input type="text"/>
	Website <input type="text"/>
	Date of establishment <input type="text"/>
3	<div> Please indicate your main current sources of financing <div> <input type="checkbox"/> National bank loans <input type="checkbox"/> Partnership <input type="checkbox"/> Savings <input type="checkbox"/> Governmental assistance <input type="checkbox"/> Foreign investment <input type="checkbox"/> International cooperation </div> </div>
4	Do you intend to wind up your operations in the near future? Yes <input type="checkbox"/> No <input type="checkbox"/>
5	Do you intend to invest in the enlargement/modernisation/ improvement of your company in the near future? Yes <input type="checkbox"/> No <input type="checkbox"/>
6	If so, please specify your enlargement/ modernisation/improvement plans <input type="text"/>
(B) STRUCTURE AND ACTIVITY	
7	What is the production capacity of your company? <input type="text"/>
8	Is your company operating at full capacity? Yes <input type="checkbox"/> No <input type="checkbox"/>
9	If not, indicate at what percentage of its capacity it is operating: <input type="text"/>
10	<div> Does it carry out any other activity? <div> <input type="checkbox"/> Packaging <input type="checkbox"/> Distribution <input type="checkbox"/> Others (please specify) </div> <input type="text"/> </div>

Production according to species						
Species	Scientific name (to be filled by interviewer)	PT*	Volume (mt)/yr	Value/yr	Origin	Destination

* Processing Type: Eviscerated (E), headed (H), filleted (F), smoked (Sm), salted (Sl), dried (D), frozen(Fz), boiled (B), preserved (Pr), peeled (Pe), etc.

Production according to processing			
Type of processing	Volume (kg)/yr	Volume (mt)/yr	Value/yr
Fresh or refrigerated prepared fish			
Frozen fish			
Frozen crustaceans			
Frozen molluscs			
Dried, salted or smoked fish			
Prepared or vacuum-packed fish			
Prepared or vacuum-packed crustaceans			
Prepared or vacuum-packed molluscs			
Canned fish			
Canned crustaceans			
Canned molluscs			
Fish powder			
By-products			
Boiling			

13	Are you the owner of the land where the facility is located?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
14	Do you have any government concession regarding the use of the land?	Yes <input type="checkbox"/>	No <input type="checkbox"/>

(C) ECONOMIC INFORMATION					
Income (in national currency):					
	Day	Week	Month	Amount	
15 Sales	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	
Subsidies / Donations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	
Other income	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	
Costs (in national currency):					
	Day	Week	Month	Amount	
Raw material	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	
Containers and packaging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	
Other supplies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	
Rentals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	
Mortgage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	
Amortization of tangible fixed assets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	
16 Repairs and maintenance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	
Transport	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	
Insurance policies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	
Supplies (fuel, electricity, gas, water...)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	
Staff costs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	
National Social Security contribution	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	
Quality Assurance System	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	
Other costs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	
Taxes (in national currency):					
	Type of tax	Day	Week	Month	Amount
17	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Financial result (in national currency):					
	Day	Week	Month	Amount	
18 Profit(+) of the activity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	
	Day	Week	Month	Amount	
Loss(-) of the activity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	

(D) MARKETING				
How do you purchase the raw material?				
		Percentage %	Value	
19	Supplied from your own boats	<input type="text"/>	<input type="text"/>	
	Directly from local fishermen	<input type="text"/>	<input type="text"/>	
	Directly from <u>designated</u> local fishermen	<input type="text"/>	<input type="text"/>	
	Directly from fishermen from other communities	<input type="text"/>	<input type="text"/>	
	Market	<input type="text"/>	<input type="text"/>	
	From aquaculturists	<input type="text"/>	<input type="text"/>	
	From intermediary agents	<input type="text"/>	<input type="text"/>	
	Imported	<input type="text"/>	<input type="text"/>	
	Others (please specify)	<input type="text"/>	<input type="text"/>	
		<input type="text"/>	<input type="text"/>	
	<input type="text"/>	<input type="text"/>		
	<input type="text"/>	<input type="text"/>		
Destination of production				
		Percentage %	Value	
20	Non-human consumption	Local market	<input type="text"/>	<input type="text"/>
		National market	<input type="text"/>	<input type="text"/>
		Regional export	<input type="text"/>	<input type="text"/>
		International export	<input type="text"/>	<input type="text"/>
		Others	<input type="text"/>	<input type="text"/>
	Human consumption	Own consumption	<input type="text"/>	<input type="text"/>
		Local market	<input type="text"/>	<input type="text"/>
		National market	<input type="text"/>	<input type="text"/>
		Regional export	<input type="text"/>	<input type="text"/>
		International export	<input type="text"/>	<input type="text"/>
		Others	<input type="text"/>	<input type="text"/>
If you are an exporter, list the main destination countries				
	Percentage %	Value		
21	<input type="text"/>	<input type="text"/>	<input type="text"/>	
	<input type="text"/>	<input type="text"/>	<input type="text"/>	
	<input type="text"/>	<input type="text"/>	<input type="text"/>	
	<input type="text"/>	<input type="text"/>	<input type="text"/>	
	<input type="text"/>	<input type="text"/>	<input type="text"/>	
	<input type="text"/>	<input type="text"/>	<input type="text"/>	
	<input type="text"/>	<input type="text"/>	<input type="text"/>	
22	Does your company offer constant supply throughout the year?		Yes <input type="checkbox"/> No <input type="checkbox"/>	

(E) EMPLOYMENT									
Full-time employment									
	Women				Men				
	No.	Hours/ day	Days/ month	Salary/ month	No.	Hours/ day	Days/ month	Salary/ month	
Non-salaried staff									
Professional workers									
Skilled workers									
23 Middle services workers									
Semi-skilled workers									
Unskilled workers									
Others (please specify)									
Part-time employment									
	Women				Men				
	No.	Hours/ day	Days/ month	Salary/ month	No.	Hours/ day	Days/ month	Salary/ month	
Non-salaried staff									
Professional workers									
Skilled workers									
24 Middle services workers									
Semi-skilled workers									
Unskilled workers									
Others (please specify)									
25	Indicate in which months of the year you employ part-time staff		<input type="checkbox"/> January <input type="checkbox"/> February <input type="checkbox"/> March <input type="checkbox"/> April		<input type="checkbox"/> May <input type="checkbox"/> June <input type="checkbox"/> July <input type="checkbox"/> August		<input type="checkbox"/> September <input type="checkbox"/> October <input type="checkbox"/> November <input type="checkbox"/> December		
26	If part-time staff employment is seasonally adjusted, which is the reason?				<input type="checkbox"/> Seasonal production <input type="checkbox"/> Seasonal demand <input type="checkbox"/> Seasonal work (specify) <input type="text"/> <input type="checkbox"/> Others (specify) <input type="text"/>				
27	Does your company provide its staff with any type of training?					Yes <input type="checkbox"/> No <input type="checkbox"/>			
28	If so, what type of training does your company provide?				<input type="text"/>				

(F) SOCIAL BENEFITS			
29	Is it covered by insurance of any kind?	Yes <input type="checkbox"/> No <input type="checkbox"/>	DK/NA <input type="checkbox"/>
30	Have you received training on the handling of fish products in the last five (5) years?	Yes <input type="checkbox"/> No <input type="checkbox"/>	DK/NA <input type="checkbox"/>
31	Have you received any government subsidy in the last five (5) years?	Yes <input type="checkbox"/> No <input type="checkbox"/>	DK/NA <input type="checkbox"/>
32	Have you received any non-governmental financial assistance in the last five (5) years?	Yes <input type="checkbox"/> No <input type="checkbox"/>	DK/NA <input type="checkbox"/>
33	Do you participate in a social security system?	Yes <input type="checkbox"/> No <input type="checkbox"/>	
34	Do you belong to a cooperative/association?	Yes <input type="checkbox"/> No <input type="checkbox"/>	
35	What services does it provide you with?	<input type="checkbox"/> Marketing <input type="checkbox"/> Supply of raw material <input type="checkbox"/> Energy supply (fuel, electricity, gas, water...) <input type="checkbox"/> Supply of materials <input type="checkbox"/> Warehousing / preservation facilities <input type="checkbox"/> Legal guidance <input type="checkbox"/> Education <input type="checkbox"/> Others (indicate which) <div style="border: 1px solid black; height: 40px; width: 100%; margin-top: 5px;"></div>	
36	Do you think that cooperatives/associations work well?	Yes <input type="checkbox"/> No <input type="checkbox"/>	DK/NA <input type="checkbox"/>
(G) FISHERY POLICY			
37	Are you familiar with your country's fish processing industry development plan?	Yes <input type="checkbox"/> No <input type="checkbox"/>	DK/NA <input type="checkbox"/>
38	Are you familiar with the laws/regulations that govern the processing sector in your country?	Yes <input type="checkbox"/> No <input type="checkbox"/>	DK/NA <input type="checkbox"/>
39	Are you or the cooperative/association that you belong to consulted as part of decision-making and planning processes?	No, never <input type="checkbox"/> Sometimes <input type="checkbox"/> Yes, always <input type="checkbox"/>	

(H) ENVIRONMENTAL INFORMATION		
40	Mark which energy supply source you use	<input type="checkbox"/> Electricity <input type="checkbox"/> Coal <input type="checkbox"/> Gas <input type="checkbox"/> Sawdust <input type="checkbox"/> Firewood <input type="checkbox"/> Wood (shavings) <input type="checkbox"/> Fuel oil <input type="checkbox"/> Others (list) <div></div>
41	Do you produce and/or market any of these by-products?	<input type="checkbox"/> Fish powder <input type="checkbox"/> Oils <input type="checkbox"/> Gelatines <input type="checkbox"/> Fertilisers <input type="checkbox"/> Leather <input type="checkbox"/> Others (list) <input type="checkbox"/> No by-products <div></div>
42	What treatment do you apply to the wastewater generated by your activity?	<input type="checkbox"/> Primary treatment <input type="checkbox"/> Secondary treatment <input type="checkbox"/> Tertiary treatment <input type="checkbox"/> No treatments
43	How do you manage the solid waste generated by your activity?	<input type="checkbox"/> Incineration <input type="checkbox"/> Animal feeds <input type="checkbox"/> Garbage dump <input type="checkbox"/> Toxic waste disposal company <input type="checkbox"/> Packaging waste management company <input type="checkbox"/> Others (please specify) <div></div>
44	Do you carry out any checks on whether the raw material used contains parasites, microorganisms or toxic, decomposed or foreign substances?	Yes <input type="checkbox"/> No <input type="checkbox"/>

(I) MAIN PROBLEMS					
Score the importance of the following obstacles/problems in terms of keeping your business running					
	1	2	3	4	5
Bureaucratic problems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Difficulty in gaining access to electricity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Difficulty in gaining access to water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Waste treatment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Problems regarding the supply of raw materials	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other supplies (generators, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Natural disasters (hurricanes, floods, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Difficulties in finding specialised staff	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Difficulties in gaining access to loans	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Difficulties in gaining access to the market/marketing of the product	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Difficulties in distribution/transport of the product	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fulfilment of environmental requirements (e.g. EIAs)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Others (please specify):					
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Score: 1= not at all important; 2= not very important; 3= neutral; 4= important; 5= very important

(J) DEVELOPMENT ACTIONS					
Score the importance that the following processing sector development actions would have in your company					
	1	2	3	4	5
Speeding up of administrative procedures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Training of specialised technicians	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Development and transfer of technology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Improvements in health control and product quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Promotion of investment in the processing industry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Promotion of the consumption of processed products	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Promotion of market opportunities for fish processing products	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Promotion of producers' organizations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Improvement of distribution/transport of fish processing products	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Implementation of HACCP systems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Implementation of traceability systems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Implementation of quality certificates	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reduction of negative impacts on the environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Boosting of R&D&i	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Design and implementation of an action plan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Others (please specify):					
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Score: 1= not at all important; 2= not very important; 3= neutral; 4= important; 5= very important

HOUSEHOLD QUESTIONNAIRE

(A) IDENTIFICATION

Identification details of the interviewee

1. Name (optional): _____
2. District / Island / County / Parish: _____
3. Community / Village: _____
4. Country of birth: _____
5. Length of time living in the Community: _____
6. If you have been living in this community for less than 5 years, which Community do you come from? _____
7. If you have moved from another geographical area, how many of your family members moved with you? _____

(B) HOUSEHOLD COMPOSITION AND CHARACTERISTICS OF FAMILY MEMBERS

Members of Household Table

1. Order No.	2. He/She is...	3. Shares Income with Household (YES / NO)	4. Civil status	5. Sex 1. M 2. F	6. Age	7. Education level (choose highest)	8. How many years of the highest level have you completed?	9. Does he/she have any disability or illness?	10. In respect of economic activity, what was his/her situation last month?
1	INTERVIEWEE								
2									
3									
4									
5									
6									
7									
8									
9									
10									

CODES

2. He/She is:

- 01 Wife / Husband
- 02 Father/ Mother(-in-law)
- 03 Son / Daughter
- 04 Brother/ Sister(-in-law)
- 05 Other relatives
- 06 Domestic service
- 07 Lodger
- 08 Guest

4. Civil status

- 01 Single
- 02 Married
- 03 Widower/Widow
- 04 Separated
- 05 Divorced
- 06 Common law

6. Age (years)

- 01 Less than 15
- 02 15 to 25
- 03 26 to 35
- 04 36 to 45
- 05 46 to 55
- 06 56 to 65
- 07 More than 65

7. Educational level

- 01 Illiterate
- 02 Semiliterate
- 03 Basic or primary education
- 04 Secondary education
- 05 Tertiary education

9. Disability

- 01 No disability or illness
- 02 Minor
- 03 Medium grade
- 04 Severe

10. Relationship with economic activity

- 01 Employed
- 02 With work but temporarily absent (due to illness, holidays...)
- 03 Unemployed, seeking work
- 04 Retired
- 05 Student
- 06 At home carrying out domestic chores
- 07 Other situation without economic activity

(C) HOME INCOME FROM THE WHOLE MEMBERS (IN NATIONAL CURRENCY)

1. Activity branch	2. Household Income	3. Income periodicity - 1 = Daily - 2 = Weekly - 3 = Monthly - 4 = Annual - 5 = Occasional	4. Months in which income is obtained	5. Income from the activity used for SELF CONSUMPTION (YES / NO)	6. Estimated value of portion used for SELF CONSUMPTION if purchased in the market
A. FISHERY			<input type="checkbox"/> All year J F M A M J J A S O N D		
B. Agriculture, cattle raising and forestry			<input type="checkbox"/> All year J F M A M J J A S O N D		
C. Exploitation of mines and quarries			<input type="checkbox"/> All year J F M A M J J A S O N D		
D. Manufacturing Industries			<input type="checkbox"/> All year J F M A M J J A S O N D		
E. Services (businesses, hotels, restaurants...)			<input type="checkbox"/> All year J F M A M J J A S O N D		
F. Transport, warehousing and communications			<input type="checkbox"/> All year J F M A M J J A S O N D		
G. Civil servant			<input type="checkbox"/> All year J F M A M J J A S O N D		
H. Training			<input type="checkbox"/> All year J F M A M J J A S O N D		
I. Tourism			<input type="checkbox"/> All year J F M A M J J A S O N D		
J. Others			<input type="checkbox"/> All year J F M A M J J A S O N D		
Remittances			<input type="checkbox"/> All year J F M A M J J A S O N D		

(D) ACTIVITY IN THE FISHERY SECTOR

1. Order No. (from Members of Household Table)	2. Professional situation	3. Daily hours worked	4. No. of days worked per week	5. Indicate if there are several members who participate together in the same activity	6. Indicate the type of fishery activity carried out

CODES**2. Professional situation**

- 01 Employed worker
- 02 Business owner without salaried workers or independent worker
- 03 Employer or Skipper
- 04 Unpaid family member (helps out in the business or company...)
- 05 Other situation (specify)

6. Types of fishery activity

- 01 Catches
- 02 Aquaculture production
- 03 Processing
- 04 Marketing
- 05 Gear construction and repairs/maintenance
- 06 Vessel construction and repairs/maintenance
- 07 Others

(E) DWELLING DATA

1. What is the tenancy status of your main dwelling?

1. Own dwelling, fully paid ☐
2. Own dwelling, paying mortgage ☐
3. Rented ☐
4. Provided, partly free of charge ☐
5. Provided, entirely free of charge ☐
6. Other (specify) ☐

2. If you are not in rented accommodation, what monthly rent would you have to pay for a similar dwelling?

Estimated monthly rent Value Currency

3. How many rooms does this dwelling have? (excluding toilet, kitchen and garage) 4. What is this dwelling's surface area? (Indicate measurement units)

5. Do the members of your household have access to the following services and/or facilities:

	In their own Home	In their own Community	Outside the community	Incidence of Service			
				Never	Rarely	Often	Very often
Toilet							
Latrine							
Running water							
Electricity							
Kitchen							
Lavatory							
Shower/ Bath							
Telephone							
Drainage system for sewage removal							

6. For cooking you mainly use:

1. Firewood ☐
2. Gas ☐
3. Coal ☐
4. Electricity ☐
5. Kerosene, alcohol ☐
6. Others ☐
7. None, does not cook ☐

7. How do you normally remove garbage?

1. By burning it ☐
2. It is collected by a garbage truck ☐
3. It is thrown into a pit ☐
4. It is thrown into a ditch, street or patio ☐
5. It is used as manure/composting ☐
6. It is thrown into a stream, river, lagoon or the sea ☐
7. Other ☐

8. Construction material (see codes):
(more than one may be indicated)

A. Exterior walls	B. Floor	C. Roof
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

9. Decidable dwelling improvements:
(more than one may be indicated)

A. Facade <input type="checkbox"/>	D. Paintwork <input type="checkbox"/>	G. Flooring <input type="checkbox"/>	J. Air conditioning <input type="checkbox"/>
B. Insulation <input type="checkbox"/>	E. Windows <input type="checkbox"/>	H. Roof <input type="checkbox"/>	K. Others <input type="checkbox"/>
C. Kitchen <input type="checkbox"/>	F. Structure <input type="checkbox"/>	I. W.C. <input type="checkbox"/>	

10. What type of dwelling does this household occupy

- Undivided private house ☐
- Flat/Apartment/Condominium ☐
- Tenement ☐
- Compound ☐
- Others (specify) ☐

11. Would you prefer to live in another type of dwelling?

- YES ☐
- NO ☐

12. Are you the owner of the land?

- YES ☐
- NO ☐

13. Equipment:

	A. Do you have...		B. Would you like to have one?		C. Can you afford it?	
	YES	NO	YES	NO	YES	NO
1. Landline phone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Mobile phone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. TV	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Washing machine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Fridge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Motor vehicle	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

CODES: Construction Materials**A. Exterior Walls**

- 01 Brick
- 02 Wood
- 03 Waste materials
- 04 Earthen
- 05 Cement block
- 06 Palm tree trunks
- 07 Cardboard, oilskin, packaging wood
- 08 Others

B. Floor

- 01 Soil
- 02 Brick
- 03 Common floor tiles
- 04 Cement
- 05 Mosaic, ceramic, granite, marble
- 06 Wooden board
- 07 Laminated board
- 08 Others

C. Roof

- 01 Roof tiles
- 02 Hollow blocks
- 03 Cement
- 04 Zinc sheeting
- 05 Wooden board
- 06 Reinforced concrete, earthenware or clay block
- 07 Palm tree trunk
- 08 Cardboard, oilskin, packaging wood
- 09 Others

(F) ACQUISITION OF GOODS AND SERVICES**HOUSEHOLD EXPENDITURES (IN NATIONAL CURRENCY)**

Item	2. Weekly amount	3. Monthly amount	4. Yearly amount
1. Food and beverages			
2. Clothing and footwear			
3. Furniture, home equipment and home maintenance expenditures			
Dwelling			
4. Rent			
5. Mortgage			
6. Water			
7. Electricity			
8. Gas or other fuels			
9. Garbage taxes			
10. Landline phone			
11. Mobile phone			
12. Internet			
13. TV fees			
14. Home insurance			
15. Domestic service			
16. Other services for the dwelling			
Transport			
17. Private transport cost			
18. Public transport costs (train, bus, boat...)			
Health			
19. Doctor			
20. Medicines			
21. Hospitals			
22. Other medical costs			
Education			
23. Primary education			
24. Secondary education			
25. Tertiary education			
26. School meals			
27. School transport			
28. Accommodation service			
29. Other educational costs			
Leisure			
30. Leisure costs (shows, culture...)			
31. Betting, gambling			
Others			
32. Consultancy, legal and funeral service costs			
33. Illness insurance costs...			

(G) SOCIOECONOMIC ASPECTS

1. Regarding the total net income of your household, to what extent do you normally make ends meet?

1. You manage to save money ☐
2. You can just about balance your income and outgoings ☐
3. You are forced to spend your savings ☐
4. You are forced into debt ☐

2. In your opinion, what minimum monthly net income would you need in order to make ends meet in a household like yours?

Net monthly income Value Currency

3. In the last 5 years, has your household been affected by any of the following problems?

1. Earthquakes ☐
2. Floods ☐
3. Hurricanes ☐
4. Fires ☐
5. Others (Indicate) ☐

4. If you have indicated any of the situations in question 3, how have you managed to sort out the problems in your household?

1. Using money from your savings or investments ☐
2. Getting into debt or getting a mortgage ☐
3. Selling goods (houses, cars, land...) ☐
4. In kind services ☐
5. Selling jewellery, domestic appliances, furniture ☐
6. You received money from relatives or friends ☐
7. You obtained loans from your workplace ☐
8. The insurance company paid out ☐
9. You received government assistance ☐
10. You received assistance from the church or NGOs ☐
11. You worked more ☐
12. Other household members began to work ☐
13. You reduced food costs ☐
14. You reduced health or education costs ☐

5. Urgent needs of the neighbourhood:

- A. Electricity ☐
- B. Public transport ☐
- C. Health centre ☐
- D. Asphaltting ☐

- E. Rubbish collection ☐
- F. Drainage network ☐
- G. Public school ☐
- H. Gas ☐

- I. Running water ☐
- J. Water-treatment plant ☐
- K. Garbage dump ☐
- L. Others ☐

6. Compared with 5 years ago, would you say that you are economically:

1. Better off ☐
2. The same ☐
3. Worse off ☐

7. Do you have access to loans for financing income-generating fisheries activities?

1. Yes ☐
2. No ☐

8. Have you ever received loans for these income-generating fisheries activities?

1. Yes, but not enough ☐
2. Yes, enough ☐
3. No ☐ → Go to 11

9. Purpose of loan

10. Source of loan

1. Loan institutions ☐
2. Non-profit interest loans from private individuals ☐
3. Loans with profitable interest from private individuals ☐

11. In the last 5 years, have you invested any or all of your savings in improvements related to your fisheries activities?

1. Yes ☐ Indicate which
2. No ☐

12. Are you thinking of investing in improvements related to your fisheries activities within the next 5 years?

1. Yes ☐ { Will you request a loan? ☐ Indicate which improvements:
- Will you use savings? ☐
2. No ☐

APPENDIX IV: List of participants in the Training Workshop

Country	Name of representative	Designation
Barbados	Mr. Colvin Taylor	Fisheries Assistant
	Ms. Antoinette Marshall	Data Collector
The Bahamas	Mr. Jeremy Saunders	Fisheries Superintendent
	Mr. Leon Pinder	Asst. Fisheries Superintendent
	Mr. Filmore Russell	Asst. Fisheries Superintendent
Belize	Ms. Marsha Vargas	Asst. Fisheries Officer
	Mr. Jaime Villanueva	Asst. Fisheries Officer
	Mr. Joel Cruz	Data Collector
Grenada	Ms. Lisa Chetram	Extension Officer
	Mr. Ron Simon	Extension Officer
	Ms. Tracy Augustine	Data Entry Clerk
Guyana	Ms. Ingrid Peters	Senior Fisheries Officer
	Ms. Nadauth Lewis	Fisheries Field Assistant
	Mr. Jomo Glen	Data Collector
Jamaica	Ms. Charlene Thomas	Senior Fisheries Instructor
	Ms. Farah Hansel	Fisheries Officer
	Ms. Marsha Reid	Data Entry Operator
Montserrat	Mr. Alwyn Ponteen	Fisheries Officer
	Mr. John Jeffers	Assistant Fisheries Officer
St. Kitts & Nevis	Ms. Delcia Brookes	Fisheries Assistant / Data Entry Clerk
	Mr. Clive Wilkinson (Nevis)	Fisheries Assistant
St. Vincent & the Grenadines	Mr. Kris Isaacs	Fisheries Officer
	Ms. Shermin Glynn-Johnson	Fisheries Assistant
Trinidad & Tobago	Mr. Garth Ottley (Tobago)	Fisheries Officer
	Ms. Michele Picou-Gill	Fisheries Officer

Country	Name of representative	Designation
	Mr. Anand Bissessar	Fisheries Assistant
Tragsatec	Ms. Mamen Arenas	Consultant
	Ms. Olga Lamas	Consultant
	Mr. Javier Martín	Consultant
CARICOM	Ms. Donette Perkins	Administrative Assistant, Sectoral Programmes
CRFM	Mr. Terrence Phillips	Programme Manager, Fisheries Management and Development
	Ms. Jannel Gabriel	Regional Project Coordinator
CARICOM Secretariat	Ms. Cathy Ann McIntyre	Planning Officer

APPENDIX V: List of participants in the Validation Workshop

Country	Name of representative	Designation
Antigua & Barbuda	Adulcie BAPTISTE-CHRISTIAN	Research Assistant Social Policy Unit/Poverty Reduction Unit
	Ian HORSFORD	Senior Fisheries Officer
The Bahamas	W. Gregory BETHEL	Senior Economist Department of Marine Resources
	Cherely KELLY	Chief Welfare Officer Department of Social Services
Barbados	Joyce LESLIE	Deputy Chief Fisheries Officer Fisheries Division
	Ms. Antoinette MARSHALL	Data Collector
Belize	Mauro GONGORA	Fisheries Officer
Dominica	Riviere SEBASTIAN	Senior Fisheries Officer
	Norman NORRIS	Fisheries Officer
Grenada	Justin RENNIE	Chief Fisheries Officer
	Gregory DELSOL	Planning Officer Ministry of Agriculture
Jamaica	Anginette MURRAY	Marine Researcher/Analyst
	Ms. Farah HANSEL	Fisheries Officer
Montserrat	Mr. Alwyn PONTEEN	Chief Fisheries Officer
St. Kitts & Nevis	Marc WILLIAMS	Director Department of Marine Resources
	Osslyn WARD	Social Development Planner
St. Lucia	Rufus GEORGE	Department of Fisheries
	Moses MONDESIR	Board Member Goodwill Fishers' Cooperative
St. Vincent & the	Jennifer CRUICKSHANK-	Senior Fisheries Officer

Country	Name of representative	Designation
Grenadines	HOWARD	
	Mr. Kris ISAACS	Fisheries Officer
	Reshevski JACK	Fisheries Officer
	Ms. Shermine GLYNN-JOHNSON	Fisheries Assistant
Suriname	Parveen AMRITPERSAD	Acting Head, Monitoring, Control and Surveillance Division
	Ronny S. DIPOTIKO	Senior data Collection Officer
Trinidad & Tobago	Ms. Michele PICOU-GILL	Fisheries Officer
	Mr. Anand BISSESSAR	Fisheries Assistant
CARICOM	Sergio GARCIA	Programme Manager – Agriculture & Industry
University of West Indies	Patrick McCONNEY	Senior Lecturer. Centre for Resource Management and Environmental Studies (CERMES)
OECS-ESDU	Peter A. MURRAY	Programme Officer III
CNFO	Joslyn LEE QUAY	Deputy Coordinator. Caribbean Network of Fisherfolk Organisations
Tragsatec	Ms. Mamen ARENAS	Consultant
	Mr. Javier MARTÍN	Consultant
	Ms. M. Dolores TARACIDO	Consultant
CRFM	Milton HAUGHTON	Executive Director CRFM Secretariat
	Susan SINGH-RENTON	Deputy Executive Director CRFM Secretariat
	Terrence PHILLIPS	Programme Manager, Fisheries Management and Development

Country	Name of representative	Designation
	Jannel GABRIEL	Regional Project Coordinator
	Maren HEADLEY	Research Graduate, Research & Resource Assessment CRFM Secretariat
	June MASTERS	Research Graduate, Information & Statistics CRFM Secretariat
	Maddison PROUDFOOT	CIDA Intern. CRFM Secretariat

APPENDIX VI: Pilot Projects working groups of Validation Workshop**PROJECT PROFILE GROUP 1**

1. PROJECT NAME: ST. JAVIER SUSTAINABILTY PROGRAMME**2. PROJECT SUMMARY:**

Provide solutions to practical needs of the fishing community Group A. This is to improve income of households by providing a training centre and upgrading the fish landing site over a two year period.

3. JUSTIFICATION:

There exists in the fishing community of St. Javier a relatively high level of unemployment in the fisheries sector, and a lots of leisure time by their spouses. In consultations with the community, the needs of the community were identified which guided the project definition.

4. PROJECT OBJECTIVES

The objectives of this project are to:

- ☐ Increase income
- ☐ Reduce unemployment
- ☐ Improve community spirit

5. KEY PROJECT ACTIVITIES

This project will comprise the following activities to deliver the outputs in set out in Section – 7.

They are:

- | | |
|---------------------|--|
| Activity – 1 | Upgrade of fish landing site – provision of ice, refrigerated storage, containers, ramp, gear storage |
| Activity – 2 | Establishment of a training and development centre to conduct training in outboard engine maintenance, gear mending for fishers, Handling and smoking of fish, tailoring |
| Activity – 3 | Promote fish as food through a Fish Fry Day initially once every 2 weeks |

6. THE KEY OUTPUTS

The specific outputs will include:

- ☐ The provision of ice, refrigerated storage, boat ramp
- ☐ Provision of a Training & Development Centre Facility
- ☐ Trained fishers (20) in engine maintenance, fishing gear maintenance
- ☐ Trained persons (15) in fish smoking,
- ☐ Trained persons (10) in tailoring

7. BUDGET

In US\$000

ACTIVITIES	UNITS	NUMBER OF UNITS	PRICE PER UNIT	TOTAL PRICE
<i>Activity – 1</i>				
<i>Activity – 2</i> -----				
TOTAL				

8. KEY BENEFICIARIES

The main beneficiaries will be broad based, comprising:

- ☐ The fishers, families who will benefit from higher income arising from increased fish landing and processed products and
- ☐ Other members of the community who work on the project

9. TIMETABLE FOR IMPLEMENTATION

It is envisaged that this project will be implemented over a two year period.

Table 1. Implementation Timetable

Activity No.	Activity Description	1	2	3	4	5	6	7	8	9	10	11	12
1	Landing site upgrade												
2	Build training facility												
3	Initiate training programme												
	Engine Maintenance				√					√			
	Gear maintenance					√		√					
	Fish handling & smoking							√	√				

10. MONITORING

- Frequency
- SELECTION OF INDICATOR

Indicator	Value before intervention	Expected value after intervention	Real Value after intervention	Degree of achievement
Unemployment rate				
Value of fish landings				
Volume of value added fish products				
Increase in family income				

PROJECT PROFILE GROUP 2

1. PROJECT NAME: PROMOTING SMALL BUSINESS IN FISHING COMMUNITIES

2. PROJECT SUMMARY:*

This project seeks to promote the development of alternative sources of income for fishing household through the innovative use of existing resources by building human capacity. The two small businesses that will be developed will be based in the tourism industry (tour guide operator) and the other in indigenous craft sector (making of hats and jewellery from local indigenous materials.)

3. JUSTIFICATION:

This project is to facilitate the reduction of vulnerability as well as engender sustainable human development of the fishing population within the community. Tourism and other income generating activities such as indigenous craft are high income earners.

4. PROJECT OBJECTIVES *

The objectives of this project are to:

- ☐ To increase family income in the fisher household using the primary resources already available.
- ☐ To provide service based skills for both men and women and craft training using indigenous materials for the women in the household.

5. KEY PROJECT ACTIVITIES *

This project will comprise the following activities to deliver the outputs in set out in Section – 7. They are:

Activity – 1: To become registered and licensed as a tourist service provider.
Training
Seek small loan if needed.
To invest in gear and seek market for operation.

Activity – 2: Handicraft training for the women

6. THE KEY OUTPUTS*

The specific outputs will include:

- ☐ Certified tour guide / sports fisher
- ☐ Small business owner
- ☐ Women become registered artisan and small business owner

7. BUDGET*In US\$000*

ACTIVITIES	UNITS	NUMBER OF UNITS	PRICE PER UNIT	TOTAL PRICE
<i>Activity – 1</i> -----				
<i>Activity – 2</i> -----				
TOTAL				

8. KEY BENEFICIARIES

The main beneficiaries will be broad based, comprising:

- ☐ The over ----- families who will benefit from higher income arising from

9. TIMETABLE FOR IMPLEMENTATION

It is envisaged that this project will be implemented over a ----- year period.

Table 1. Implementation Timetable

Activity No.	Activity Description	1	2	3	4	5	6	7	8	9	10	11	12
1	-----												
2	-----												

10. MONITORING*

- Frequency
- SELECTION OF INDICATOR

Indicator	Value before intervention	Expected value after intervention	Real Value after intervention	Degree of achievement
Income	9,578.93	11,065.01	20,600.00	11,065.01

PROJECT PROFILE GROUP 3

1. PROJECT NAME: SEAWEED CULTIVATION AND MARKETING**2. PROJECT SUMMARY:**

The Project will involve the cultivation and marketing of seaweed by the St. Javier Cooperative in Prosperity to supplement the fisher's household income.

3. JUSTIFICATION:

There is a high demand in the international market for carageenan (extracted from seaweed) which is used in the preparation of hair products, cosmetics, food products etc. The target species of seaweed is available locally and the environmental conditions are favourable for its production.

4. PROJECT OBJECTIVES

The objectives of this project are to:

- ☐ Create employment opportunities
- ☐ Increase household income
- ☐ Reduce the level of poverty

5. KEY PROJECT ACTIVITIES

This project will comprise the following activities to deliver the outputs in set out in Section – 7. They are:

<i>Activity – 1</i>	Training
<i>Activity – 2</i>	Planting and maintenance
<i>Activity – 3</i>	Harvesting
<i>Activity – 4</i>	Drying, primary processing and packaging
<i>Activity – 5</i>	Marketing

6. THE KEY OUTPUTS

The specific outputs will include:

- ☐ Reducing the unemployment rate by 2% in the first year and over a five year period, reduce the overall unemployment rate to 10%.

- ☐ Producing 200 tonnes of dried seaweed in the first year and increase the production by 10% per annum in a five year period
- ☐ Reducing the level of poverty by 1% in the first year and over a five year period, reduce the overall level of poverty to 5%

7. BUDGET

It is anticipated that the initial capital investment would be approx. US \$300 (inclusive of materials required). The cooperative would provide the initial labour in kind. *In US\$000*

ACTIVITIES	UNITS	NUMBER OF UNITS	PRICE PER UNIT	TOTAL PRICE
<i>Activity – 1</i> -----				
<i>Activity – 2</i> -----				
TOTAL				

8. KEY BENEFICIARIES

The main beneficiaries will be broad based, comprising:

- ☐ All members of the fisher's family

9. TIMETABLE FOR IMPLEMENTATION

It is envisaged that this project will be implemented over a ----- year period.

Table 1. Implementation Timetable

Activity No.	Activity Description	1	2	3	4	5	6	7	8	9	10	11	12
1	-----												
2	-----												

10. MONITORING

- Frequency
- SELECTION OF INDICATOR

Indicator	Value before intervention	Expected value after intervention	Real Value after intervention	Degree of achievement
Unemployment rate	20%	18% after 1 st year and 10% after 5 years		
Household income	\$11,000 (avg)	\$14,000		

Level of poverty	11%	10% after 1 st year and 5 % after 5 years		
------------------	-----	--	--	--

1. PROJECT NAME: TRAINING AND RESOURCE MOBILIZATION FOR JOB CREATION AND ECONOMIC DIVERSIFICATION**2. PROJECT SUMMARY:**

This project seeks to reduce unemployment in St. Javier by diversifying the employment base in St. Javier through the training of the unemployed in net making and repair, boat building and repairs. This project will also focus on women in the house by helping them use their leisure time to prepare meals for sale. The project will also seek to enhance the tourism product by encouraging fishers to use their downtime to do whaling watching and other tourism related activities.

3. JUSTIFICATION:

The high levels of unemployment and the lack of diversification of the economy has contributed to high poverty levels in St. Javier require that sound interventions be made to address this problem.

4. PROJECT OBJECTIVES

The objectives of this project are to:

- ☐ Training the unemployed
- ☐ Economic diversification
- ☐ Foster gender equity

5. KEY PROJECT ACTIVITIES

This project will comprise the following activities to deliver the outputs in set out in Section – 7. They are:

- | | |
|----------------------------|---|
| <i>Activity - 1</i> | Conduct a series of training sessions in boat and net building and maintenance. |
| <i>Activity - 2</i> | Conduct training for women in food preparation |
| <i>Activity - 3</i> | Conduct training in business management |
| <i>Activity - 4</i> | Conduct training in craft making, and tour guiding |
| <i>Activity - 5</i> | Mobilize resources to equip trained persons to facilitate businesses |

6. THE KEY OUTPUTS

The specific outputs will include:

- ☐ 50 people trained in boat and net repair and maintenance
- ☐ 20 women trained in preparation
- ☐ 60 people trained in business and financial management
- ☐ 30 new businesses established

7. BUDGET*In US\$000*

ACTIVITIES	UNITS	NUMBER OF UNITS	PRICE PER UNIT	TOTAL PRICE
<i>Activity – 1</i> Conduct a series of training sessions in boat and net building and maintenance.	Training workshops	3	5,000	15,000
<i>Activity – 2</i> Conduct training for women in food preparation				
<i>Activity – 3</i> Conduct training in business management				
<i>Activity - 4</i> Conduct training in craft making, and tour guiding				
<i>Activity 5</i> Mobilize resources to equip trained persons to facilitate businesses				
TOTAL				

8. KEY BENEFICIARIES

The main beneficiaries will be broad based, comprising:

- ☐ The over ----- families who will benefit from higher income arising from –

9. TIMETABLE FOR IMPLEMENTATION

It is envisaged that this project will be implemented over a ----- year period.

Table 1. Implementation Timetable

Activity No.	Activity Description	1	2	3	4	5	6	7	8	9	10	11	12
1	-----												
2	-----												

10. MONITORING

- Frequency

○ SELECTION OF INDICATOR

Indicator	Value before intervention	Expected value after intervention	Real Value after intervention	Degree of achievement
Unemployment	20	10		
Fishing dependency rate	87	67		
Poors	11	6		
Vulnerables	6	3		
Vessel repairs and maintenance	0	25		

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