



10th EDF SPS Project

COST BENEFIT ANALYSIS AND IMPACT OF COMPLIANCE AND NON-COMPLIANCE WITH SANITARY AND PHYTOSANITARY REQUIREMENT FOR CARIFORUM COUNTRIES

FINAL REPORT





COST BENEFIT ANALYSIS AND IMPACT OF COMPLIANCE AND NON-COMPLIANCE WITH SANITARY AND PHYTOSANITARY REQUIREMENT FOR CARIFORUM COUNTRIES

FINAL REPORT

This report is submitted by:

Megapesca Lda.

Alfeizerão, PORTUGAL

10th March 2017



10th EDF SPS Project:

Support to the Caribbean Forum of ACP States in the Implementation of Commitments Undertaken Under the Economic Partnership Agreement (EPA): Sanitary and Phytosanitary Measures (SPS)

"This action was funded by the European Union under the 10th European Development Fund – Sanitary and Phytosanitary Measures (SPS) Project being executed by the Inter-American Institute for Cooperation on Agriculture (IICA)".

The views expressed herein can in no way be taken to reflect the official opinion of the European Union.

TABLE OF CONTENTS

- EXECUTIVE SUMMARY 1
- 1 Introduction..... 5
 - 1.1 Background and study rationale 5
 - 1.2 About this report 5
- 2 Methodology..... 7
 - 2.1 Review of the WTO system of SPS measures 7
 - 2.2 Cost Benefit Analysis (CBA) 7
 - 2.2.1 Regional Scope of the study 7
 - 2.2.2 Data collection..... 7
 - 2.2.3 Approach to Cost Benefit Analysis 8
- 3 WTO System of Sanitary and Phytosanitary Measures..... 11
 - 3.1 SPS and TBT Measures..... 11
 - 3.1.1 The TBT agreement 11
 - 3.1.2 The SPS Agreement 11
 - 3.1.3 Which Agreement applies – TBT or SPS..... 12
 - 3.1.4 Transparency provisions 14
 - 3.2 Relevant international organisations 14
 - 3.2.1 World Animal Health Organisation (OIE)..... 14
 - 3.2.2 International Plant Protection Convention (IPPC) 15
 - 3.2.3 The Codex Alimentarius 16
 - 3.3 Evaluation tools..... 17
 - 3.4 Recommendations for best international practices in the application of SPS measures..... 18
- 4 Agricultural and Food Trade in the CARIFORUM Region..... 20
 - 4.1 CARIFORUM national economic indicators..... 20
 - 4.2 Employment 21
 - 4.3 Main trade value chains of relevance 22
 - 4.4 Main trade partners of relevance 24

4.5	Intra-Regional Trade.....	24
4.6	Main issues in agricultural trade.....	25
4.7	Tourism	27
5	Stakeholders and Stakeholder Interests.....	28
5.1	Interests in SPS.....	28
5.2	Consumers	28
5.3	Food and agricultural business operators	30
5.4	National Competent Authorities.....	31
5.5	Regional bodies.....	32
5.6	Development partners	34
6	Compliance in Strategic Export Markets.....	35
6.1	Non-compliance.....	35
6.2	EU and EU Member States import control systems.....	37
6.2.1	Live animals, food and feed products of animal origin, and live plants	37
6.2.2	Feed and food of non-animal origin.....	37
6.3	Requirements applicable to food business operators.....	38
6.4	EU inspections	38
6.5	US import control system	39
6.5.1	Non-Meat Food Products.....	39
6.5.2	Meat, poultry, egg products and catfish	41
6.5.3	Food establishments	41
6.6	EU and US Border rejections.....	42
6.6.1	Differences between EU and US rejection rates.....	42
6.6.2	Commodity-specific non-compliances.....	45
6.6.3	Costs of rejections in international trade.....	47
7	Benefits and Costs of SPS Compliance.....	49
7.1	Overview of costs and benefits	49
7.2	Trade benefits of improved compliance	50
7.2.1	Gaining and retention of market access	50

7.2.2	Improved value and volume of trade.....	51
7.3	Public Benefits	51
7.3.1	Improved public health.....	51
7.3.2	Improved veterinary and plant health.....	52
7.4	Public Sector Costs of SPS compliance	54
7.4.1	Investment costs.....	54
7.4.2	Operational costs.....	55
7.4.3	Employment costs and benefits.....	56
7.5	Private Sector	57
7.5.1	Compliance strategies	57
7.5.2	Value Chains	57
7.5.3	Investment costs.....	59
7.5.4	Operating costs	59
8	Case Studies: Cost Benefit Analysis	61
8.1	Selection of case studies	61
8.2	SPS compliance scenarios	62
8.3	Fisheries products.....	63
8.3.1	Fisheries and Aquaculture production and trade.....	63
8.3.2	SPS Concerns.....	66
8.3.3	Benefits under compliant SPS+ system.....	69
8.3.4	Costs of compliant SPS+	69
8.3.5	Compliance cost benefit analysis	71
8.4	Fresh and prepared Fruit and Vegetables	72
8.4.1	Fruit and vegetables production and trade	72
8.4.2	SPS concerns	75
8.4.3	Benefits under compliant SPS+ system.....	77
8.4.4	Costs of compliant SPS+	77
8.4.5	Compliance cost benefit analysis	79

8.5 Poultry products	79
8.5.1 Production and Trade	80
8.5.2 SPS concerns and risks.....	82
8.5.3 Benefits under compliant SPS+ system.....	84
8.5.4 Costs of compliant SPS+	85
8.5.5 Compliance cost benefit analysis	87
9 CARIFORUM Regional and National Cost Benefit Analysis	88
9.1 Application of the case studies to the CARIFORUM agri-food trade.....	88
9.2 Regional CBA of enhanced SPS compliance on trade	89
9.3 National costs and benefits.....	91
10 Conclusions and Recommendations	94
10.1 Conclusions.....	94
10.2 Recommendations.....	95
Annex 1: References	97
Annex 2: Field Missions	101
Annex 3: Persons Met.....	102
Annex 4: SPS system evaluation tools	111
Annex 5: Detailed cost benefit analyses	116
Annex 6: Costs and benefits of enhanced SPS+ measures for CARIFORUM countries	119

TABLES

Table 1:	Examples of TBT and SPS measures in fishery products (e.g. frozen tilapia fillets)	11
Table 2:	Country profiles for the fifteen CARIFORUM countries (2014 apart from Agr. pop. 2012)	17
Table 3:	CARIFORUM's international trade in agri-food products 2014 (US\$ million)	20
Table 4:	CARICOM Export of selected agri-food products by destination in 2014	21
Table 5:	Rapid alerts (border rejections) by the EU in 2016 of products consigned by CARIFORUM countries	23
Table 6:	CARIFORUM countries sanitary controls for fishery products: Regional indicators of status (December 2016)	34
Table 7:	Relative rejection rate indicator (RRRI) at the EU and US borders (2002-2010)	38
Table 8:	US Import alerts (Detention without physical examination) from CARIFORUM countries	41
Table 9:	FDA refusals by cause and country for Fisheries-related products (HS03) in 2015	42
Table 10:	SPS compliance cost categories	45
Table 11:	Impacts of foodborne illnesses per year in selected countries (various years 2010-2015)	47
Table 12:	Examples of main SPS risks and associated costs	49
Table 13:	Producer-level responses to new SPS standards	52
Table 14:	CARIFORUM Trade in agri-food commodity groups in 2014	56
Table 15:	CARIFORUM annual fisheries production (tonnes)	58
Table 16:	CARIFORUM countries export of Fish products (HS 03 USD\$ thousand)	60
Table 17:	Countries authorised to export Fisheries products to EU	62
Table 18:	Changes in Belize seafood (HS03) export markets following EU ban for most of 2014 (US\$ thousand)	63
Table 19:	Benefits of SPS+ scenario assumed for Fisheries and Aquaculture products	64
Table 20:	Public Sector costs to upgrade and operate an SPS+ compliant Competent Authority for fishery and aquaculture products	65
Table 21:	Private sector costs to upgrade and operate SPS+ facilities (vessels and establishments)	66
Table 22:	Area cultivated for crops and tonnage produced in 2014	67
Table 23:	Fruit and Vegetables produced by Jamaica in 2014 (without sugar cane)	68
Table 24:	Exports of fresh and processed Fruit and Vegetable products from CARIFORUM countries in 2014 (US\$ thousand)	69
Table 25:	Benefits of SPS+ scenario assumed for Jamaica Canned Ackee	71
Table 26:	Estimated public sector costs in establishing and operating a competent authority for export of ackee	72
Table 27:	Private sector costs to upgrade and operate SPS+ facilities (vessels and establishments)	72

Table 28:	Trade benefits over 10 years from strengthened SPS compliance for Jamaica canned ackee example	73
Table 29:	CARIFORUM Broiler Meat (HS0207) production and trade in 2012 and 2014	75
Table 30:	Benefits of Poultry SPS+ scenario assumed a 'typical' CARIFORUM country	79
Table 31:	Estimated Public Sector Poultry import displacement in a 'typical' CARIFORUM country	79
Table 32:	Private sector costs to upgrade and operate SPS+ additional Poultry facilities	80
Table 33:	CARIFORUM's international trade in agri-food products 2014 (US\$ million)	83
Table 34:	CARIFORUM Regional costs and benefits of enhanced SPS compliance over 10 years (US\$ million)	84
Table 35:	CBA SPS+ Public costs, private costs and trade benefits multipliers for main commodity groups	85
Table 36:	Regional CARIFORUM CBA	86

FIGURES

Figure 1:	Decision tree to identify institutional responsibilities for SPS and TBT measures	10
Figure 2:	CARICOM's intra-regional trade 2001-2013	22
Figure 3:	WHO Burden of foodborne diseases. 2015	26
Figure 4:	Essential components of a national SPS compliance system	31
Figure 5:	Rejection scores (RRRI) for CARIFORUM countries exports to the EU	39
Figure 6:	Rejection scores (RRRI) for CARIFORUM countries exports to the US	39
Figure 7:	Benefits from SPS compliant national agri-food production	45
Figure 8:	Value chain components for the CB analysis	53
Figure 9:	Fisheries and aquaculture production (tonnes, World Bank WDI and CRFM)	59
Figure 10:	CARIFORUM agricultural Crop in 2014 (12.4 billion tonnes without sugar cane)	68
Figure 11:	Origin of CARIFORUM of Poultry meat (% HS0207 US\$321,216) imported in 2014	74

TEXT BOXES

Box 1:	Strengthen Family Farmers' Links with (Mainly) Domestic Markets in LAC	19
Box 2:	CBA Fisheries and Aquaculture Products Case Study	66
Box 3:	CBA Canned Ackee Case Study	73
Box 4:	CARICOM Poultry Industry Structure in 2014	76
Box 5:	CBA CARIFORUM poultry case study	81

ACRONYMS

ACP	African, Caribbean and Pacific Group of States
AHPNS	Acute Hepatopancreatic Necrosis Syndrome
AI	Avian influenza
BEEP	Banana Export Expansion Programme
BPA	Belize Producer Organisation
CA	Competent Authority
CABA	Caribbean Agricultural Business Association
CAC	Codex Alimentarius Commission
CAHFSA	Caribbean Agricultural Health and Food Safety Agency
CARDI	Caribbean Agricultural Research and Development Institute
CaribVET	Caribbean Animal Health Network
CARICOM	Caribbean Community
CARIFORUM	Forum of Caribbean States
CARIRI	Caribbean Industrial Research Institute
CARPHA	Caribbean Public Health Agency
CBA	Cost Benefit Analysis
CBEA	Caribbean Banana Exporters Association
CBP	Customs and Border Protection (US)
CCP	Critical Control Point
CDC	Centers for Disease Control and Prevention
CED	Common Entry Document
CEDA	Caribbean Export Development Agency
CGMP	Current Good Manufacturing Practice
CIL	Central Investigation Laboratory, Belize
CPHD	Caribbean Plant Health Directors
CPM	Commission on Phytosanitary Measures
CRFM	Caribbean Regional Fisheries Mechanism
CROSQ	CARICOM Regional Organisation for Standards and Quality
DPE	Designated Point of Entry
DWPE	Detention Without Physical Examination (US FDA)
ECLAC	Economic Commission for Latin America and the Caribbean
EDF	European Development Fund
EMS	Early Mortality Syndrome
EPA	Economic Partnership Agreement
EU	European Union
FAO	Food and Agricultural Organization of the United Nations
FDA	Food and Drug Administration (US)
FSIS	Food Safety and Inspection Service
FSMA	Food Safety Modernization Act (2011)
FSVP	Foreign Supplier Verification Programs
FTA	Free Trade Area (CARICOM and the Dominican Republic)
FVO	Food and Veterinary Office
GAP	Good Agricultural Practices
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product

GFSI	Global Food Safety Initiative
GMOs	Genetically Modified Organisms
GMP	Good Manufacturing Practices
HACCP	Hazard Analysis Critical Control Points
HS	Harmonised System Codes of Commodity Classification
HPAI	Highly Pathogenic Avian Influenza
IICA	Inter-American Institute for Cooperation on Agriculture
ILO	International Labour Organisation
IPPC	International Plant Protection Convention
IRR	Import Refusal Report
ISPM	International Standards for Phytosanitary Measures
ITC	International Trade Commission
IUU	Illegal, unreported and unregulated (wild fisheries)
JECFA	Joint FAO/WHO Expert Committee on Food Additives
JECM	Joint Expert Committee on Microbiology
JMPR	Joint FAO/WHO Expert Meeting on Pesticide Residues
LCU	Local Currency Unit
LDC	Less Developed Country Development status (CARICOM art. 4)
LPAI	Avian Influenza, of the Low Pathogenicity kind
NCC	National Codex Committees
NPPOs	National Plant Protection Organizations
NTM	Non-Tariff Measures
OASIS	FDA's Operational and Administrative System for Import Support
OECD	Organisation for Economic Co-operation and Development
OECS	Organisation of Eastern Caribbean States
OIE	World Animal Health Organisation
PAHO	Pan-American Health Organization
PCHF	Preventive Controls for Human Food
PRPs	Prerequisite Programs
PVS	Performance, Vision and Strategy
RASFF	Rapid Alert System for Food and Feed
RRRI	Relative Rejection Rate Indicator
SIDS	Small Island Developing States
SMEs	Small to Medium size Establishments
SPO	Small Producer Organization
SPS	Sanitary and Phytosanitary (agreement, measures)
STDF	WTO Standards and Trade Development Facility
TBT	Technical Barriers to Trade
UN	United Nations
UNIDO	United Nations Industrial Development Organization
US	United States of America
USDA	United States Department of Agriculture
VKI	Fish Inspection Institute of Suriname (Vis Keurings Instituut)
WAHIS	World Animal Health Information System
WDI	World Development Indicators (World Bank)
WINFA	Windward Islands Farmers Association
WTO	World Trade Organization
WTTC	World Travel and Tourism Council

INTERNET RESOURCES

Organisation	Website
CODEX – FAO	http://www.fao.org/fao-who-codexalimentarius/codex-home/en/
Doha Development Agenda Trade Capacity Building Database	http://tcbdb.wto.org
Economic Commission for Latin America and the Caribbean (ECLAC)	http://caribbean.cepal.org/t/small-island-developing-states
EU ACP – TBT project	http://www.acp-eu-tbt.org/pageprojects.cfm?frm_region=CAR
International Phytosanitary Portal	https://www.ippc.int/ipp
International Portal on Food Safety, Animal & Plant Health	http://www.ipfsaph.org/
World Organisation for Animal Health	http://www.oie.int
Standards and Trade Development Facility	www.standardsfacility.org
World Bank – Topic on Trade	http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/TRADE/0,,menuPK:176760~pagePK:149018~piPK:149093~theSitePK:239071,00.html
WTO SPS Information Management System	http://spsims.wto.org/Default.aspx?Lang=0

CARIFORUM COUNTRIES ISO CODES AND EXCHANGE RATES USED IN STUDY

ISO3	ISO2	Name	Currency	ISO code	2014 Exchange rate /US\$
ATG	AG	Antigua and Barbuda	East Caribbean Dollar	XCD	2.70
BHS	BS	Bahamas, The	Bahamian dollar	BSD	1.00
BRB	BB	Barbados	Barbadian dollar	BBD	2.00
BLZ	BZ	Belize	Belize dollar	BZD	2.00
DMA	DM	Dominica	East Caribbean Dollar	XCD	2.70
DOM	DO	Dominican Republic	Dominican Peso	DOP	43.56
GRD	GD	Grenada	East Caribbean Dollar	XCD	2.70
GUY	GY	Guyana	Guyanese Dollar	GYD	206.45
HTI	HT	Haiti	Haitian Gourde	HTG	45.22
JAM	JM	Jamaica	Jamaican dollar	JMD	110.93
KNA	KN	St. Kitts and Nevis	East Caribbean Dollar	XCD	2.70
LCA	LC	St. Lucia	East Caribbean Dollar	XCD	2.70
VCT	VC	St. Vincent and the Grenadines	East Caribbean Dollar	XCD	2.70
SUR*	SR	Suriname	Surinamese Dollar	SRD	3.30
TTO	TT	Trinidad and Tobago	Trinidad & Tobago Dollar	TTD	6.41

Source: LCU per US\$2014 average – WDI World Bank; ISO codes from www.iso.org; *2015

ACKNOWLEDGMENTS

The consultants would like to thank the IICA for the kind and helpful support provided by many persons during this project. The SPS Project Manager, Janet Lawrence and Carol Thomas, International Agricultural Health and Food Safety Specialist, both based in Barbados, provided guidance, technical documentation and support throughout, as well as helped with travels and IICA connections in the five countries visited.

In the countries visited, we would like to acknowledge the warm welcome and help with meetings, transport, key resource persons and documents from IICA Offices and IICA Representatives. In particular: Tamara Gentles in **Jamaica**, who handled the in-country logistics and managed to arrange a meeting with André Gordon just before he travelled out of the country; all staff at the IICA office in **Trinidad and Tobago** for being so welcoming despite their busy schedules, especially Gregg Rawlins (IICA Representative), Lisa Harrynanan (Agricultural Health and Food Safety Specialist), Edric Harry (Policy Analyst and Planning Specialist) for their expertise, and Jesse Williams who handled the in-country logistics; in **Saint Lucia**, everybody at the office and in particular Brent Theophile (Technical Specialist) who sourced invaluable economic studies and Sylvanus Augustine who made sure that all key people were met, however busy and wherever they were; in **Barbados** Ena Harvey (IICA Representative), Carol and Janet who made time in their busy schedules and also Sharon Ellis who skilfully made complicated travel arrangements; in **Suriname**, Curt Delice (IICA Representative) and Dino Demidof (Technical Specialist) gave advice and information, Mavis Sabajo provided patient support as meetings were organised and changed through the kind expertise and company of Suenita Rosan and Sadhana Janhie from the Agriculture Ministry.

This project would not have been possible without the time and shared knowledge of more than a 150 government employees and entrepreneurs met and interviewed during the five weeks in country. They are too numerous to mention individually, but their tremendous help and assistance is truly appreciated.

EXECUTIVE SUMMARY

Introduction

This report describes a study of the “Cost Benefit Analysis and Impact of Compliance and Non-compliance with Sanitary and Phytosanitary Requirements for CARIFORUM Countries”. The study was undertaken under the Sanitary and Phytosanitary (SPS) Measures Programme managed by the Inter-American Institute for Cooperation in Agriculture (IICA) under the European Union (EU)-funded 10th European Development Fund (EDF). The study was undertaken by the consultancy firm Megapesca Lda. of Portugal.

The specific aims of this study, conducted during the period 1st September 2016 to 10th March 2017 were to:

- Review the international trade framework for SPS Measures from the point of view of the CARIFORUM; and
- Identify the specific costs and benefits of compliance and non-compliance with SPS requirements and the effect on market access and on the livelihood of stakeholders, in order to increase understanding of the role and importance of SPS requirements in relation to imports and exports.

In the Caribbean region export of agri-food commodities totalled US\$1.80 billion annually in 2015 (7% of all exports) and imports US\$5.2 billion (18% of all imports). The balance of trade in agri-food products is highly negative (US\$3.4 billion/year) with imports nearly three times greater than exports. Only Belize and Guyana run an agricultural trade surplus, but this appears to be declining. Agriculture provides only a small fraction of Gross Domestic Product (GDP) in the region (around 0.1%) and is of lower economic significance compared to sectors such as tourism, energy and finance. However, the agricultural sector is of great importance regionally, in terms of socio-economics and food security, with at least 8 million (29% of the population) dependent on agriculture in 2012 (FAO, 2014). Furthermore, one feature common to all CARIFORUM countries, given the limited extent of arable land, is the importance of small and family-run farms.

WTO Agreement on SPS measures

The World Trade Organization (WTO) Agreement on the Application of SPS Measures, the International Plant Protection Convention (IPPC), the Codex Alimentarius and the World Animal Health Organisation (OIE) describe the lawful conditions under which technical standards on plant health, food safety and animal health, respectively, may be applied in international trade. Meeting the requirements of such standards presents a significant challenge to developing countries, whose participation in trade may be hampered. As a result, countries that are not able to invest in robust SPS control systems incur costs due to non-compliance of agri-food business operators with the requirements of export markets. A better understanding of the costs and benefits of SPS system implementation can help to guide the investment choices of policy makers. It should be noted that certification requirements for voluntary standards (such as Good Agricultural Practices, or ISO22000) are not SPS measures and were considered to be outside the scope of this study which focuses exclusively on meeting requirements.

Methodology

Cost Benefit Analysis (CBA) is the economic analysis tool of choice to assess the economic costs and benefits of various options chosen to enhance SPS capacity. Costs of SPS compliance fall in various ways. Public sector competent authorities invest in and operate regulatory systems, including building capacity for control and, in many cases, provision of laboratory testing. Private sector operators at all levels of the supply chain (farmers, distributors, processors and exporters) sustain the costs of complying with regulatory requirements, such as upgrading facilities and equipment, installation of new control systems such as Hazard Analysis Critical Control Points (HACCP) and traceability, as well the additional costs of operating them.

The benefits of SPS compliance fall into two main categories:

1. Firstly, trade benefits are observed when products comply with SPS requirements; since the risk of rejection in export markets is lower, products can access premium export markets, and investment confidence increases. Export volumes therefore increase, as well as per unit added value of export. In addition, due to increased protection from the introduction of pests and diseases, increased investment leads to import substitution.
2. Secondly, SPS-compliant production reduces the frequency and severity of SPS incidents, such as food poisoning outbreaks (which can destroy consumer confidence—a necessity for the regional tourism industry) or transmission of plant pests and animal diseases (which undermine national agricultural production systems serving domestic and export markets), thus reducing the costs sustained by consumers, and improving productivity of farmers and society in general.

The project considers all 15 CARIFORUM countries. The CARIFORUM is the forum of Caribbean States which are signatories to the African, Caribbean and Pacific Group of States (ACP)-EU Partnership Agreement or 'Cotonou Agreement' and a regional Economic Partnership Agreement with the EU. CARIFORUM consists of the 14 Caribbean Community (CARICOM) Member States and the Dominican Republic. Trade data is not always directly available for all 15 countries together, but in this report, unless otherwise specified, trade figures have been aggregated to reflect the position of the CARIFORUM group as a whole. The primary source of trade data used in the study was derived from the International Trade Commission (ITC) TradeMap database.

The study, through a series of interviews conducted with stakeholders from competent authorities and the agri-food supply chain in five countries supported by an extensive literature review, was able to define three case studies to allow accurate estimates of SPS compliance costs, and the trade related benefits. These three case studies were conducted in the fishery, fresh and prepared fruit and vegetables (ackee) and poultry sub-sectors.

A cost benefit model was developed which considers two scenarios: 1) without SPS strengthening, and 2) with enhanced SPS measures (SPS+), for separate products or commodity groups. The 'without project' or business as usual scenario is applied to each commodity group, and the current costs of the SPS systems are taken as the baseline for government and for the private sector. The 'with project' scenario introduces additional capital investments to improve SPS compliance (for the public and for the private sector) in the first year or two, and additional operational costs depending on the investment. A set of assumptions is laid out for the industry to 1) grow (number of firms, sites, persons employed) with increased levels of exports, and/or to 2) sell its production at a premium price (US\$/tonne). Added value is thus generated in the SPS+ scenario by increased volume of sales and improved unit value (higher profits). A comparison of the costs and benefits allows for the calculation of a ratio between them.

The findings of the individual case studies were extrapolated to the regional trade conditions, with the extrapolations weighted to reflect the relative importance of the different sub-sectors, fishery, fruit and vegetable, and poultry products, in the export and import profiles. The regional data was further disaggregated to national levels, to provide an indicator of the costs and trade benefits of SPS compliance that might be accrued by each CARIFORUM country, again weighted to reflect the relative importance of their individual trade flows.

Main findings

The overall results of the study show that investments in the upgrading of SPS conditions in the 15 CARIFORUM countries provide clear positive benefits, well in excess of the costs involved. Increased investment in SPS compliance of US\$97.4 million/year (2.4% of annual food and agricultural export trade value) could be expected to deliver trade benefits of US\$306 million/year (a ratio of benefits to costs of 3.14 to 1). Overall, for every US\$1 spent, US\$3.14 of economic benefits are derived. Sustained over a period of 10 years, an annual expenditure of approximately US\$100 million/year would therefore be estimated to generate an additional value added of US\$314 million a year through improved trading conditions. These benefits correspond to a 5% increase in current agricultural value added (US\$6.2 billion in 2014), but only a relatively insignificant increase in current GDP (due to the economic dominance of non-agricultural sectors such as energy, finance, and tourism). The major impacts of enhanced SPS+ measures would therefore be to sustain the employment of significant numbers of people engaged in the agricultural and fisheries sectors and their dependents, and to contribute to the food security of the national populations.

In addition to trade benefits, enhanced SPS regimes would be expected to improve the health of national populations due to improved safety of food and reduced incidence of food borne disease. Here, the estimated cost of health care and lost productivity (through death and illness) is estimated at about US\$1.4 billion per year for the region. The billions of hidden export earnings from tourism are substantially dependent on ensuring that safe food continues to be provided to almost 29 million visitors each year. The risk of introduction of damaging plant pests and animal diseases, which can potentially destroy important productive sectors, would also be reduced, resulting in less frequent and less damaging outbreaks. Here benefits, although not quantifiable, are particularly important in relation to limiting the spread of plant pest and protecting poultry and emergent aquaculture sectors from disease introduction.

Whilst the precise share of costs will depend, to an extent, on policy related to public support for farmers and other operators in the supply chain, the study suggests that about 55% of the investments will need to be made in public goods and services (SPS control systems, laboratories, and subsidies) and about 45% will need to be made by the private sector (in upgraded supply chain conditions and systems such as HACCP and traceability). Therefore, even though official SPS control systems may be upgraded (through investment in strengthening capacity of competent authorities, regulations, and laboratories), the limited ability of large numbers of small scale operators to finance the corresponding upgrades along the supply chain, will be likely to limit the outcome in terms of the improved sanitary and phytosanitary status of the region.

Recommendations

Given the clear benefits of SPS investment, the consultants therefore recommended that **strengthening of public sector SPS control systems and implementation by agri-food business operators should be strongly supported by national and regional policy measures.**

In order to ensure that such investments can be undertaken by small and medium sized business operators in the agri-food supply chain, it is further recommended that **financial mechanisms should be developed to support the required private sector investment**. This can include credit lines, but it should also **consider a re-orientation of agricultural and fisheries subsidies from input support (such as seeds, fertiliser, fuel, engines) to grant support for capital investment in SPS-compliant production**.

A pre-condition for such investments is a minimum scale of operations. In the private sector this means that **policy support for the establishment of formally constituted collective organisations** (i.e. with legal personality) should also be included in the support measures. **Phased implementation of SPS measures over time (to recognise limited capacity of the sector to respond) should therefore be coordinated with agricultural policy on subsidies**.

Given that the benefits related to protection of public and agricultural health are considerable, and at least as large as improved trade, it is further recommended that future **efforts to develop SPS controls should not be exclusively focused on meeting export market requirements, but should equally address the safety of imports and national control systems within an integrated SPS management system** (to ensure that domestic consumer health, including that of tourist visitors, and agricultural production are not undermined). **The need for an integrated approach to SPS controls with clearly defined and exclusive mandates should be the primary driver for a recommended consolidation and restructuring of national institutions throughout the region**.

Furthermore, to ensure optimal developmental impacts, **investment should be risk-based, focusing on strengthening official control systems for the most SPS-sensitive commodities**. This would apply to those sectors where employment and livelihoods are most exposed to SPS risks (e.g. domestic poultry), where export benefits can be clearly obtained through improved market penetration (e.g. fruit and vegetable sector), and where current risks are not well controlled (e.g. ciguatera in the fishery sector). Political will is required in all cases, not just to allocate priorities and budgets, but **to ensure that sanctions are applied effectively to ensure that non-compliant national operators cannot supply products to the market**.

SPS investments are not fully scalable, in that there is a certain minimum size below which control systems cannot be viable (for example in terms of laboratory capacity). It should be recognised that some countries within the region have limited agricultural and fisheries production, where the dimensions of the sector cannot justify the minimum level of investments in SPS compliance systems. In these countries, which may include Dominica, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Grenada and Antigua and Barbuda, there is a clear argument for regionalisation of SPS services. Larger countries can also derive benefits from SPS+ regionalisation through reduced cost and improved efficiency of controls. **It is therefore recommended that regional bodies make greater efforts to develop regional services to support the SPS activities of the national competent authorities. In this respect, there is a need to determine the precise range of support functions to be provided by regional bodies, and to ensure that there is a coherent provision of services between the different agencies concerned**.

1 INTRODUCTION

1.1 Background and study rationale

The study “Cost Benefit Analysis and Impact of Compliance and Non-compliance with Sanitary and Phytosanitary Requirements for CARIFORUM Countries” was undertaken for the Project, ‘Support to the Forum of Caribbean States in the implementation of the commitments undertaken under the Economic Partnership Agreement (EPA): Sanitary and Phytosanitary (SPS) Measures’ implemented by the Inter-American Institute for Cooperation in Agriculture (IICA) under the European Union (EU)-funded 10th European Development Fund (EDF). The study was undertaken by the consultancy firm Megapesca Lda. of Portugal.

The SPS Project specific objective is to support the CARIFORUM states to gain and improve market access by complying with Europe’s SPS measures and thus increase production and trade in agriculture and fisheries that meet international standards while protecting plant, animal and human health and the environment.

International trade is an important part of the economies of Caribbean countries, and much of this is in agricultural and food products, which if not subject to adequate controls can transmit human, plant and animal diseases. Sanitary and phytosanitary measures are regulatory controls which are therefore often applied by countries to limit such spread, but this can have impacts on trade, since such measures are considered as non-tariff barriers. There are costs associated with non-compliance, as well as costs and benefits in terms of improved controls to meet such conditions.

The specific aims of this study, conducted during the period 1st September 2016 to 10th March 2017 were to:

1. Review the international trade framework from the point of view of the CARIFORUM and
2. Identify the specific costs and benefits of compliance and non-compliance with SPS requirements and the effect on market access and on the livelihood of stakeholders, in order to increase understanding of the role and importance of SPS requirements in relation to imports and exports.

1.2 About this report

The report describes the nature of SPS measures and sets them in the context of the World Trade Organisation and the international standard setting bodies. It looks at some of the recommendations for best international practices in SPS, in terms of the investments and the nature of regulatory control systems required. The report follows with a brief profile of the CARIFORUM trade in agri-food products that are subjected to SPS measures, highlighting the main commodities and trade partners and flows. It goes on to consider the nature and interests of stakeholders in the SPS systems of CARIFORUM countries and describes how they inter-relate, thus illuminating some of the factors which often need to be taken into account in the design of SPS controls systems. The report then considers the nature of non-compliance and seeks to assess its extent and consider, in a qualitative manner, the types of impacts that non-compliance may bring, suggesting where different costs may occur. This leads

onto a more detailed consideration of the costs and benefits, and suggests a structured approach to how they be assessed. Finally, using a case study approach, the study seeks to assess the socio-economic costs of non-compliance and the benefits of compliance with implementing SPS measures as well as the impact on the supply chain (i.e. small farmers, processors, and exporters) in the case studies in three sectors of the agri-food industry. The study then extrapolates (with assumptions) these results to the regional level and then, finally, considers the implications of these findings for the future development of SPS control systems in the region.

2 METHODOLOGY

2.1 Review of the WTO system of SPS measures

The three components of the WTO Agreement on the Application of Sanitary and Phytosanitary Measures (SPS)—the International Plant Protection Convention (IPPC), the Codex Alimentarius and the World Animal Health Organisation (OIE) —are reviewed to describe the scope of the obligations that CARIFORUM countries have to assume, and the legal and technical provisions needed to address the obligations. The review provides a brief summary of best practices in the organisation and implementation of SPS measures, as well as a structured template to identify missing or weak components, and a basis to apportion the costs of compliance with SPS measures.

2.2 Cost Benefit Analysis (CBA)

Information on costs and benefits of compliance and non-compliance with SPS measures came primarily from publicly available databases on volumes and values of traded commodities. People met during the country visits provided data files and copies of relevant past and on-going studies. A CBA spreadsheet model approach was developed and applied.

2.2.1 Regional Scope of the study

The Revised Treaty of Chaguaramas establishing the CARICOM Single Market and Economy (2001) compels Member States to create an efficient and effective sanitary and phytosanitary regime, which can be applied by all Members, and to harmonise their laws and administrative processes to effect such a Regime (Articles 57 and 74). These provisions are also included in the later Treaty with the Dominican Republic, specifically aiming to “establish a common system of Rules of Origin, Customs Co-operation, and the Harmonisation of Technical, Sanitary and Phyto-Sanitary Procedures”. The study therefore includes the Dominican Republic.

The project considers all 15 CARIFORUM countries. The CARIFORUM grouping comprises CARICOM members and the Dominican Republic. Thus, trade statistics are available for CARICOM, representing a regional free trade grouping, but not always available for CARIFORUM. Where necessary, CARIFORUM trade data was estimated by aggregating data from CARICOM and the Dominican Republic.

2.2.2 Data collection

Five CARIFORUM countries were visited for the purpose of data collection from identified stakeholders: Barbados, Jamaica, St Lucia, Suriname and Trinidad and Tobago. Statistical data are analysed for countries and commodities either as a whole, or separately, according to the specific aspects of costs, benefits or risks linked to a commodity or market to be analysed.

The data compiled for the 15 CARIFORUM countries is from a number of public sources and from reports and interviews. Sources are indicated in brackets for the information categories below:

- National economy, and economic activities (World Development Indicators, World Bank)
- Trade [volumes and values] for imports and exports, by commodities and commodity groups and markets (TradeMap, United Nations-World Trade Organization [UN-WTO] International Trade Centre)
- Instances of non-compliance from border rejections and trade ban for the main markets (EU- Rapid Alert System for Food and Feed [RASFF] and US- Import Refusal Report [IRR]) by commodity group and originating country
- Cost information, for capital investments (public and private facilities), operational costs, training, inspection and other enforcement costs and fines (own compilation, from various reports and interviews).

It is important to note that within the time allocated for this project and its wide scope, with fifteen countries and all agri-food groups, a relatively crude scale of analysis had to be used. The analysis therefore addresses trade in commodities classified by the Harmonised System (HS) at the first or second level of detail, presented at regional and national levels. Detailed conclusions for specific products are beyond the scope of this study.

2.2.3 Approach to Cost Benefit Analysis

Korinek et al (2007)¹ reviewed the methods used to measure impacts of government-mandated standards and non-tariff measures (NTM) on trade in the agri-food sector. They consider two main approaches:

- Ex-ante analysis, which attempts to simulate the response of producers and consumers to new or modified standards before regulatory changes are introduced, and
- Ex-post analysis to estimate observed or historical differences or changes in trade flows associated with the application of upgraded standards.

The ex-post analysis is best adapted to this study, but comprehensive quantifications of the overall trade effects, across agri-food products at national level or across markets for a given product, is difficult due to:

- Interactions between non-tariff (NTMs) and tariff measures, which can be comparatively high for agri-food products;
- Interactions between public (SPS) and private non-mandatory (i.e. voluntary) standards, the latter being outside the scope of this study;
- Large differences of trade impacts between agri-food products and between non-harmonised standard provisions in different markets;
- Changes in standards (and tariff measures) and changes in enforcement over time;

¹ OECD, 2007. A review of methods for quantifying the trade effects of standards in the agri-food sector. Trade Policy Working Paper No.79. J. Korinek, M. Melatos and M.-L. Rau, 52p. TAD/TC/CA/ WP(2007)1/FINAL

- A general paucity of detailed information, at national and at firm levels in order to quantify production and markets (imports, exports and local consumption) responses.

A consensus has now emerged with WTO, UN and donor agencies, that **investments in meeting SPS conditions should reflect the economic benefits to be gained from compliance**. It is impossible to control everything all the time, and SPS risks should be assessed, and as far as possible quantified as the basis for investment decisions, based on a cost benefit analysis. This is the premise of the current study.

The WTO Standards and Trade Development Facility (STDF) proposes a stepwise use of economic analysis methods to improve the use of limited national and donor resources, to increase the efficiency of technical cooperation and to enhance aid effectiveness². In this context, **Cost Benefit Analysis (CBA) is the economic analysis tool of choice to assess the costs and benefits of various options chosen to enhance SPS capacity**. The CBA is widely applied to SPS systems, although not often for a group of countries, commodities, and markets at the same time. Therefore, the approach for this study is to use available data to analyse separate commodity groups, exporting countries and markets in order to illustrate key challenges and draw recommendations pertinent to CARIFORUM countries.

Taking into account the limitation of quantitative analysis, the following empirical method was adopted to estimate the specific costs and benefits of compliance and non-compliance with SPS requirements and the effect on market access and on the livelihood of stakeholders:

1. Generate relevant data from case-studies using selected commodities and products, for selected CARIFORUM countries and across the region, identified during the field missions
2. For each case study, define a baseline (i.e. current) and a 'with standard' (i.e. with enhanced SPS measures) scenario
3. Identify and document possible impacts on trade and stakeholders, differentiating costs and benefits to the private sector and to the public sector
4. Extrapolate identified costs and benefits within the case study sectors to all commodities at regional levels

The **CBA spreadsheet model** therefore considers two scenarios: 1) 'without' SPS strengthening project, and 2) 'with' project, for separate products or commodity groups.

The **'without' project or business as usual scenario**, describes the structure of the productive industry for the commodity group in the case study, in terms of numbers of exporters, processing firms and number of production or farm sites, according to the value chain components identified for the commodity group. The generic module is applied to one commodity group, produced in one country, both exported (to EU, US, CARIFORUM) and sold locally. In the without project scenario, each market is defined by its value. The current costs of business in terms of the SPS system are taken as the baseline, for government and for the private sector.

² S. Henson, 2011. Overview of the use of economic analysis to set priorities for SPS capacity-building, IDS presentation to STDF, 25p.

The **'with' project scenario** introduces capital investments to improve SPS compliance (SPS+, for the public and for the private sectors) in the first two or three years, and additional operational costs depending on the market targeted and the investment. As a result, a set of assumption is laid out for the industry to:

1. Grow in volume (in terms of number of firms, sites, persons employed) with increased levels of exports: and/or to
2. Sell its production at a premium price (US\$/tonne).

Value is thus generated by increased volume of sales and improved unit value (higher profits). Even if SPS compliance does not result in higher prices, improved productivity in the supply chain (through reduced rejections, access to premium markets) resulting in increased value added, can be reflected as an increase in unit price.

In the model employed, the main indicator used to compare scenarios is the benefit-cost ratio, the financial benefit in money terms for each unit of additional financial cost. In addition, it is assumed that this will bring benefits in employment (through increased production and processing).

The model used is kept simple, to reflect the crude working assumptions, and the general lack of detailed economic information. For example, it does not account for the time value of money by discounting the cash flows. The detailed working assumptions, including the impact of SPS systems on trade, are discussed in Section 7.

3 WTO SYSTEM OF SANITARY AND PHYTOSANITARY MEASURES

There are two specific WTO agreements dealing with product standards in general, and food safety and animal and plant health and safety. It is important to introduce their differences and complementarity.

3.1 SPS and TBT Measures

The Sanitary and Phytosanitary Agreement³ and the Technical Barriers to Trade (TBT) Agreement were two of the outcomes of the 1986–1994 Uruguay Round of world trade negotiations. Membership of the WTO requires countries to adhere to these agreements in the way they set and apply technical conditions in international trade. The TBT Agreement seeks to ensure that regulations, standards, testing and certification procedures do not create unnecessary obstacles. The Sanitary and Phytosanitary Measures Agreement sets out the basic rules relating to food safety and animal and plant health conditions.

3.1.1 The TBT agreement

The TBT agreement recognises countries' rights to adopt standards for any product, which they consider to be appropriate—for example, for protection of human, animal or plant life or health; for the protection of the environment; or to meet other consumer interests. It recognises that the '*appropriate level of protection*' may vary between countries. The Agreement requires that the procedures used to decide whether a product conforms to relevant standards should be applied in a fair and equitable manner (i.e. that they are non-discriminatory). The Agreement also encourages countries to recognise each other's procedures for assessing whether a product conforms. The Agreement also sets out a code of good practice for governments and non-governmental or industry bodies to prepare, adopt and apply voluntary standards.

3.1.2 The SPS Agreement

Article 2 of the WTO SPS Agreement allows governments to apply restrictions on trade in order to protect human, animal or plant life or health, provided they are based on sufficient scientific analysis and do not discriminate or use this as disguised protectionism.

The SPS Agreement therefore covers all measures whose purpose is to protect the following:

- Human or animal health from food-borne risks;
- Human health from animal- or plant carried diseases;
- Animals and plants from pests or diseases;
- The territory of a country from damage caused by pests.

The SPS Agreement sets out the basic rules that apply when countries wish to implement regulatory measures on trade concerning food safety and animal and plant health requirements. The need for the SPS Agreement

³. Official title is: WTO Agreement on the Application of Sanitary and Phytosanitary Measures

arose because sanitary and phytosanitary measures can be very easily and effectively applied to restrict trade for protectionist purposes, and WTO member governments wanted to have clear rules on how they can be used.

The Agreement allows countries to set their own regulatory standards, but it also specifies that regulations must be based on scientific principles and should be applied only to the extent that they are necessary to protect human, animal or plant life or health. Furthermore, they should not unjustifiably discriminate between countries where similar conditions exist. Where a WTO member country applies the standards developed by a relevant international body, they are considered to meet the requirements of the Agreement. However, members may also use measures that result in higher levels of health protection, so long as their measures are based on an appropriate assessment of risks and the approach is consistent.

SPS Measures include those which help to ensure that food is safe for consumers, and to prevent the spread of pests or diseases among animals and plants. These measures can take many forms, such as requiring products to come from a disease-free area, inspection of products, specific treatment, or processing of products, setting allowable maximum levels of harmful substances or limiting the permitted use of additives in food. The measures, whether sanitary (human and animal health) or phytosanitary (plant health) must apply equally to domestically-produced food or local animal and plant diseases, as well as to products coming from other countries.

3.1.3 Which Agreement applies – TBT or SPS

The TBT Agreement covers all technical regulations, voluntary standards, and the procedures to ensure that these are met, except when these are sanitary or phytosanitary measures as defined by the SPS Agreement.

Note that it is the desired impact of the measure that determines whether it is the TBT or the SPS Agreement that applies. Some measures applied to product (such as labelling) may be TBT measures, whilst other measures applied to the same product (such a maximum limit of a hazardous substance) may be regarded as subject to the SPS measures. Not all 'standards' are the same in international trade law, and the distinction is important, since it can be used to determine which organisation within a state is the responsible competent authority. Figure 1 shows a decision tree, which can be applied for this purpose. As an example of the application of this logic to a specific product, Table 1 shows how different measures applied to the same product (a fish fillet) may be classified.

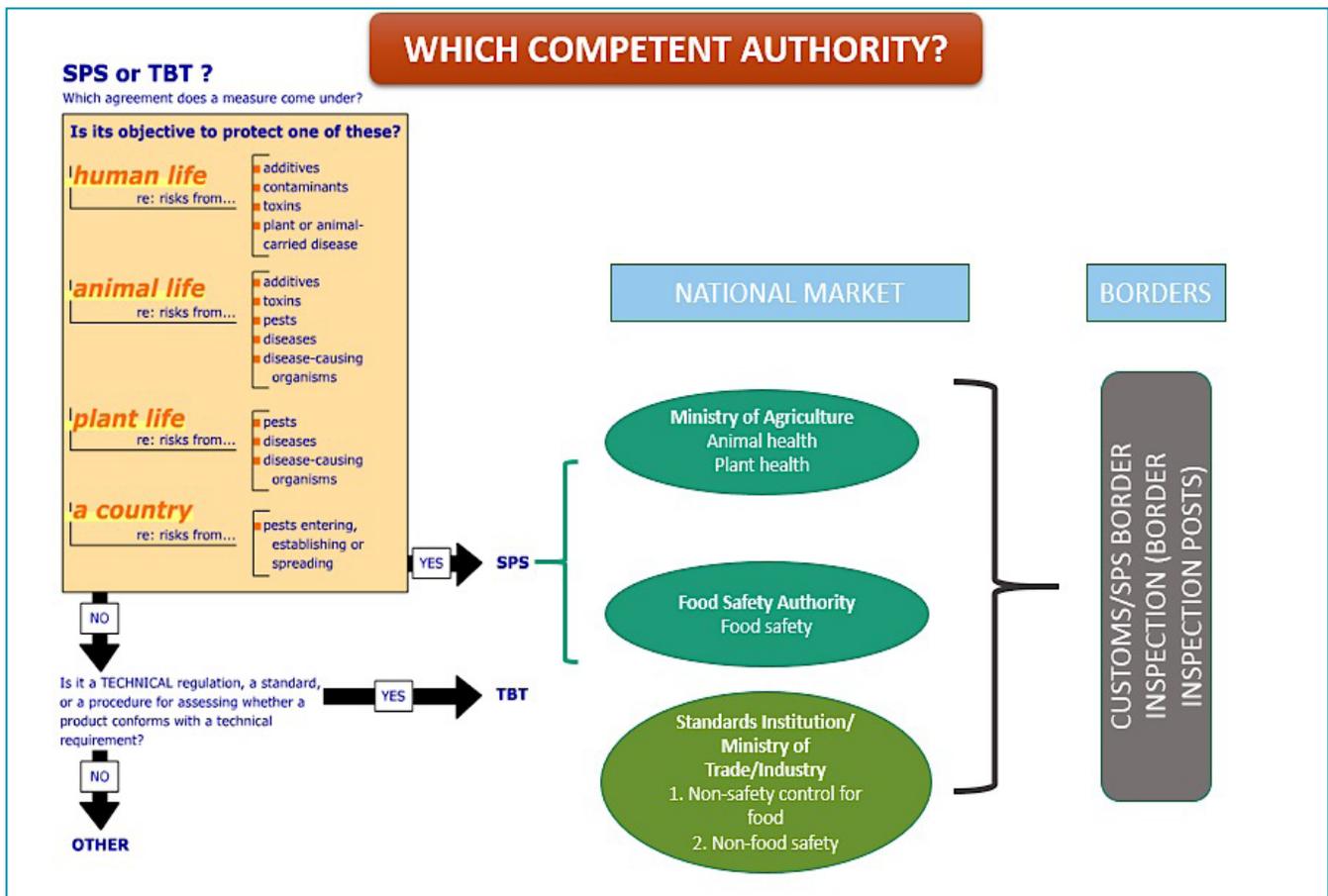


Figure 1: Decision tree to identify institutional responsibilities for SPS and TBT measures

Source: Megapesca, 2016

Table 1: Examples of TBT and SPS measures in fishery products (e.g. frozen tilapia fillets)

Measure	Justification	TBT/SPS
Requirement to be graded according to size and quality (Extra, A, B, C, D)	Informs buyers and consumers of the quality and allows price transparency	TBT
Controls on plasticizers in packaging materials	Prevention of product contamination with materials harmful to consumer health	SPS
Requirement to be processed subject to HACCP rules	Ensure that food safety hazards are controlled	SPS
Requirement for labelling with country and region of origin, and whether wild or farmed	Informs buyers and allows price transparency	TBT
Controls on residues of veterinary medicines	Prevention of exposure of consumers to a) prohibited substances; and b) permitted substances above safe levels.	SPS

3.1.4 Transparency provisions

The SPS Agreement also contains transparency provisions, which are designed to ensure that business operators and trading partners know about measures taken to protect human, animal and plant health. The Agreement requires governments to promptly publish all sanitary and phytosanitary regulations. When other governments ask, they should explain the reasons for any particular food safety or animal or plant health requirement.

All WTO member governments must therefore maintain an Enquiry Point, an office designated to receive and respond to any requests for information regarding that country's sanitary and phytosanitary measures. Such requests may be for copies of new or existing regulations, information on relevant agreements between two countries, or information about risk assessment decisions. Contact details for Enquiry Points can be consulted electronically through the SPS Information Management System (<http://spsims.wto.org>).

Whenever a government is proposing a new regulation (or modifying an existing one) which differs from an international standard and may affect international trade, it must notify the WTO Secretariat, which then circulates the notification to other WTO member governments. It should appoint a single notification authority for this purpose. The notifications are also published on the WTO web site. Governments must submit the notification before a proposed new regulation is implemented, so that trading partners have an opportunity to comment. The WTO publishes guidance on the establishment of the SPS Enquiry Point and Notification Authorities⁴.

3.2 Relevant international organisations

The SPS Agreement encourages governments to base their national measures on the international standards, guidelines and recommendations developed by relevant international organisations. These organisations include, for food safety, the joint FAO/WHO Codex Alimentarius Commission; for animal health, the World Animal Health Organisation; and for plant health, the Food and Agricultural Organization of the United Nations (FAO) International Plant Protection Convention. When cases of international trade disputes regarding SPS measures are taken through the WTO dispute resolution process, the standards, guidelines, and recommendations developed by these organisations are to be regarded as the *de facto* reference standard. The same applies if governments have not yet translated mandatory standards into national legislation.

WTO member governments participate in the standards setting work of these organisations—including work on risk assessment and the scientific determination of the effects on human health of pesticides, contaminants, or additives in food; or the effects of pests and diseases on animal and plant health. The work of these technical organisations is subject to international scrutiny and review, and standards are only adopted after substantial consultation.

3.2.1 World Animal Health Organisation (OIE)

The Office International des Epizooties (OIE) was established as an intergovernmental organisation responsible for improving animal health, by an international Agreement in 1924. In May 2003, the Office became the World Organisation for Animal Health but kept its historical acronym OIE. The OIE is recognised as the reference organisation for animal health measures by the WTO. The OIE currently has a total of 180 Member Countries, is headquartered in Paris, and maintains 12 regional and sub-regional offices on every continent.

⁴ Procedural Step-by-step Manual for SPS National Notification Authorities & SPS National Enquiry Points, Sally Jennings, WTO Secretariat, February 2011 https://www.wto.org/english/res_e/booksp_e/sps_procedure_manual_e.pdf

The organisation is placed under the authority and control of a World Assembly of Delegates designated by the Governments of all Member Countries, and who meet at least once a year. The main functions of the Assembly are to adopt international standards and resolutions on the control of the major animal diseases and to elect the Director General and members of the governing bodies of the OIE.

The OIE has also established Specialist Commissions with a mandate to study problems of epidemiology, prevention, and control of animal diseases, and to develop and revise OIE's international standards. These reflect the specific areas of interest as follows:

- **Terrestrial Animal Health Standards Commission** (Terrestrial Code Commission); responsible for ensuring that the recommendations of the Terrestrial Animal Health Code (the Terrestrial Code) reflect current scientific information on the protection of international trade and surveillance methods for animal diseases and zoonoses.
- **Scientific Commission for Animal Diseases** (Scientific Commission); responsible for identifying the most appropriate strategies and measures for disease prevention and control. It also examines Member Country submissions regarding their animal health status
- **Biological Standards Commission** (Laboratories Commission); responsible for establishing or approving methods for diagnosing diseases of mammals, birds, and bees, and for recommending the most effective biological products, such as vaccines.
- **Aquatic Animals Commission**; responsible for the Aquatic Animal Health Code (the Aquatic Code) and the Manual of Diagnostic Tests for Aquatic Animals (the Aquatic Manual) and relating to diseases of amphibians, crustaceans, fish, and molluscs and on methods used to control them.

The OIE therefore publishes two main codes (Terrestrial and Aquatic) and two manuals (Terrestrial and Aquatic) as the principle references for WTO members establishing animal health measures for the control of animal health and welfare.

3.2.2 International Plant Protection Convention (IPPC)

The International Plant Protection Convention is an international treaty that aims to prevent and to control the introduction and spread of pests of plants and plant products. The Convention extends beyond the protection of cultivated plants to the protection of natural flora and plant products (i.e. it covers some aspects of environmental measures). It also considers indirect damage to plants, for example by weeds. The Convention has been in force since 1951, and was revised in 1997 to harmonise with the new role under the SPS Agreement. Along with its adopted standards, it provides the *de facto* benchmarks for countries applying SPS measures to protect their plant resources from pests applied in international trade.

Implementation requires countries to nominate their National Plant Protection Organizations (NPPOs) as being the service established by government to discharge the functions specified by the IPPC. In addition, governments may jointly establish Regional Plant Protection Organizations (RPPOs), which can act as coordinating bodies at a regional level to achieve the objectives of the IPPC.

The Commission on Phytosanitary Measures (CPM) implements the IPPC and facilitates cooperation between all contracting parties (currently 182). The CPM Bureau is a seven-member elected executive body of the CPM

that provides guidance to the IPPC Secretariat and CPM on strategic direction, cooperation, and financial and operational management. The IPPC Secretariat is based in the FAO Headquarters in Rome.

IPPC adopts International Standards for Phytosanitary Measures (ISPMs) as the basis for phytosanitary measures applied in trade by the Members of the World Trade Organization under the SPS Agreement. The Standards in themselves are not regulatory instruments but come into force once countries establish corresponding requirements within their national legislation.

Up to 2016, a total of 37 ISPMs have been adopted and are in force⁵. They cover the principles of operation of a phytosanitary control system; the framework for conducting pest risk analyses; requirements for the establishment of pest free areas; and surveillance, certification, notification requirements and guidelines on diagnostic protocols and specific control methods such as irradiation, control of fruit flies, etc.

An important part of the work of the IPPC is helping members to strengthen their plant health control systems. The Convention encourages support to developing countries in order to improve the effectiveness of their NPPOs and to participate in regional and global IPPC processes. The design and application of the Phytosanitary Capacity Evaluation tool (see 3.3 below) is part of this process, but it also involves mobilising the support for FAO technical cooperation programmes and other donors programmes for capacity building and strengthening plant protection infrastructures (such as diagnostic and quarantine facilities and staff training) and updating legislation.

3.2.3 The Codex Alimentarius

The FAO and WHO jointly established the Codex Alimentarius Commission (CAC) in 1963 as an internationally recognised institution for the development of food standards. Codex has agreed and adopted standards, guidelines, codes of practice and related texts, which together form the basis of a global harmonised food regulation system. It is therefore imperative for key stakeholders to be aware of its operations and significance to consumers, food producers and processors, and food control agencies. Since December 1994 and the signing of the General Agreement on Tariffs and Trade (GATT), Codex standards have become reference texts used by WTO for the settlement of international trade disputes, and hence, are increasingly becoming used as the baseline, reference food standards in international trade.

Codex has two categories of membership: 'National government bodies' and 'Observers'. Full members represent some 99% of the global population. Only members can be formally involved in decision-making. All CARIFORUM countries are full members. The Codex Alimentarius Commission meets every two years in either Rome or Geneva, the respective bases of FAO and WHO. The Commission has committees that do the detailed work and prepare draft standards, guidelines or other texts for the Commission to consider for approval, with the process managed by the CAC Secretariat, based at FAO headquarters in Rome. Currently there are 24 standard-setting and coordinating committees whose work programme is determined by the Commission. Codex also depends on Expert Technical Committees of FAO and WHO to advise on technical safety aspects of food. These are, the Joint FAO/WHO Expert Committee on Food Additives (JECFA), the Joint Expert Meeting on Pesticide Residues (JMPR) and the Joint Expert Committee on Microbiology (JECM).

At the national level, Codex member countries are required to specify Codex Contact Points. In addition, National Codex Committees (NCCs) should be set up to establish forums for discussion and for the formulation of the

⁵ For a complete list see: https://www.ippc.int/static/media/files/publication/en/2016/08/ISPM_List_2016-08-16_En-BANNER.pdf

national response to Codex proposals and to ensure that new national regulations do not conflict with Codex standards. The effective operation of National Codex Committees is therefore an important task to be integrated within a country's food safety and SPS institutional structure.

Once the Commission formally adopts a Codex standard, Member States can adopt it. Provided that a food complies with the standard, countries can allow its free distribution. A country that cannot accept the standard for, say health reasons, has the right to make specified deviations that have to be declared, along with the reasons for any such deviations. The Codex Secretariat keeps a record of those countries that have adopted Codex texts.

There are in place 340 Codex documents, which address different aspects of food safety:

- Food regulatory systems (inspections)
- Food safety management
- Food safety
- Food quality
- Nutrition
- Labelling

As noted previously, not all Codex standards relate to SPS measures (which deal with food safety); some are related to TBT measures. The distinction is relevant in the national choice of regulatory approach. More information, along with all 341 standards can be found on the CAC website⁶.

3.3 Evaluation tools

There are several tools available for the assessment of SPS control systems. They are designed to assess the relevance, effectiveness, and efficiency of SPS control systems, either as an internal or external evaluation. Official evaluation tools have been designed by the OIE in relation to animal health (the Performance of Veterinary Services tool), the IPPC in relation to plant health (the Phytosanitary Capacity Evaluation tool) and the FAO, representing Codex Alimentarius in relation to food safety (the draft tool for the Assessment of Food Control Systems). These are described in more detail in Annex 4.

It should also be noted that the IICA has developed specific regional tools for assessing the performance, vision, and strategy (PVS) of:

- a) National Plant Protection Organisations;
- b) National Veterinary Services;
- c) National Food Safety Services; and
- d) National SPS Services⁷.

⁶ <http://www.fao.org/fao-who-codexalimentarius/codex-home/en/>

⁷ For an example of this latter tool see "Performance, vision and strategy (PVS): for sanitary and phytosanitary measures: an institutional vision; Eric Bolaños Ledezma and Ana Marisa Cordero Peña: IICA, 2008.32p. available at: <http://repiica.iica.int/docs/B0744i/B0744I.pdf>

3.4 Recommendations for best international practices in the application of SPS measures

A review of several interventions to strengthen SPS conditions was undertaken by United Nations Industrial Development Organization (UNIDO) in 2012⁸. This assessed some of the key lessons to be accounted for in the design of an SPS control systems. These represent some of the best international practices in SPS management, and are summarised below.

Inter-ministerial conflicts over responsibilities can limit national implementation capacity, especially in food safety (where legacy systems can often be based on institutions defined primarily by commodity-linked responsibilities such as meat, fish, plants, etc.). Interventions should work towards clarifying responsibilities and, in particular, promoting a unitary approach to official controls of food safety where feasible.

There should be a **lawful, clear, and exclusive nomination of the Competent Authority (CA)** for risk management of SPS in each area of food safety, animal health and plant health. It should always be possible to identify the organisation (and its chief) responsible. Experience shows that shared responsibility, means no responsibility (especially the case in a crisis).

Establishing such a degree of clarity in the institutional framework is often a major barrier to the development of effective and efficient SPS control systems, especially in the case of food safety. Whilst animal health and plant health usually fall exclusively within the mandate of a single ministry (responsible for agriculture), **food safety responsibilities are often embedded in primary legislation establishing the powers of authorities responsible for veterinary, fisheries, standards, and public health functions**. Establishing a single agency or even an effectively coordinated multi-agency food safety system therefore may require simultaneous amendment of fundamental and exclusive mandates of existing institutions. A key pre-requisite for resolving these issues is the **existence of a multi-agency stakeholder committee** as the forum for debate and discussion (such as a national food safety committee, the Codex committee or a national SPS committee). Crucially, this should **include private sector representation**.

The Central Competent Authority should provide strategic management of their SPS area, in addition to addressing technical needs for inspection, nomination of laboratories, etc. This is necessary if the development of effective compliance systems is to go further than protecting consumers in export markets, and is to meet the development objective of delivering benefits in terms of enhanced trade and poverty reduction. In particular, competent authorities should consider the following functions:

- Establishing detailed procedures for follow-up of non-compliances;
- Strengthening the design, implementation and interpretation of sampling and laboratory testing programmes;
- Integration of food hygiene controls within a single food safety control system (rather than commodity or sectoral controls, meat, fish, plants, etc.)

⁸. Food Safety Alert – Rapid Response Facility (FSA-RRF); First Concept Note on the Facility and initial Pilot Applications, Strategic Cooperation between UNIDO and European Commission Directorate General for Consumer Health and Safety (DG SANCO), United Nations Industrial Development Organization, August 2012

- Delegation of official control functions to other relevant national bodies where appropriate;
- Effective management of CA-laboratory relationships;
- Improving the integrity of delivery of control activities.
- Application of cost benefit analysis in the choice of official controls to be applied;

Inspection authorities may be nominated separately from the competent authorities responsible for risk management, but their activities should be determined by the competent authority (for example by applying service level agreements and associated audits). Ideally inspection bodies should be accredited to the standard of ISO17024 "Conformity assessment - General requirements for bodies operating certification of persons".

Trade benefits are maximised when compliance support is provided for industry as well as strengthening of CAs; otherwise industry struggles to respond to stricter enforcement of standards, due to lack of capital for investment. For example, it is pointless to establish a rule requiring HACCP implementation without supporting operators to design and install such systems. Essentially, change only occurs when regulatory systems apply the pressure **and** financial and technical support provides the incentive.

Trade benefits are also maximised when standards and compliance systems are applied generically to a sector, rather than on a market-by-market basis. Meeting specific requirements of export markets for part of the production from a given sector results in two-tier systems, where international standards apply to some operators and their export supply chains within a sector and, effectively, none to other export and domestic markets.

Support is required for technical institutions to provide sources of **qualified personnel and expertise necessary for longer-term sustainability of SPS compliance systems**; this applies particularly to technical institutes involved in research, testing and training.

Testing laboratories should not necessarily be bound to inspection services; since laboratories are expensive to operate, a regional approach to laboratory provision is indicated for more complex tests in countries with a relatively small level of exports.

The active involvement of **export industry and trade associations** provides substantial and sustainable benefits in ensuring requirements are understood and applied.

Residue monitoring programmes for heavy metals and other hazards need to be addressed as a means of guiding risk assessment, thus allowing CAs to focus scarce control resources on the most frequent and severe hazards.

Specific system integrity and anti-corruption measures need to be included to ensure the sustainability of investments in SPS control systems.

Specific needs of the small-scale operators in the agricultural and fishery sectors should be considered, because they have special needs in meeting the hygiene and quality requirements of the global market, in particular, with relation to limited technical capacity and lack of access to capital. Special attention is required to prevent these sectors from being marginalised by technical barriers to international trade.

4 AGRICULTURAL AND FOOD TRADE IN THE CARIFORUM REGION

4.1 CARIFORUM national economic indicators

Agricultural and food production in CARIFORUM countries is determined largely by geography. Mountains and forests limit the extent of arable land inland, while tourism and urban development encroach on agricultural land in coastal areas.

The fifteen CARIFORUM countries are very diverse in land area, population density, gross domestic product (GDP) and agricultural potential (Table 2). They are located across 12° of longitude and 30° of latitude around the Caribbean Sea and offer a rich diversity of fisheries products, food crops and culinary traditions that are highly valued by international markets and tourists.

In 2014, the Agriculture Value Added was in excess of US\$6.2 billion for the region and represented 10% or more of the GDP for Belize, Dominica, Guyana, Jamaica, Suriname and, most likely, Haiti (Table 3).

Table 2: Country profiles for the fifteen CARIFORUM countries (2014 apart from Agr. pop. 2012)

Country	Land area (km ²)	Population	Arable land (km ²)	Pop. density (/km ² land area)	Rural pop. (% total)	GDP per capita (current US\$)	Agric. Value Added (% GDP)	Agric. pop. (%) 2012
Antigua and Barbuda	440	90,900	40	206.59	75.81	13,432	2.40	19.8
Bahamas, The	13,880	383,054	80	38.27	17.20	22,217	1.77	2.3
Barbados	430	283,380	110	659.02	68.45	15,366	1.44	2.5
Belize	22,970	351,706	780	15.42	55.88	4,884	15.52	23.1
Dominica	750	72,341	60	96.45	30.74	7,252	15.93	20.6
Dominican Republic	48,670	10,405,943	8,000	215.35	21.94	6,147	6.21	10.4
Grenada	340	106,349	30	312.79	64.42	8,574	7.07	20.0
Guyana	214,970	763,893	4,200	3.88	71.54	4,028	18.61	14.0
Haiti	27,750	10,572,029	10,700	383.60	42.56	830		57.7
Jamaica	10,990	2,720,554	1,200	251.21	45.44	5,119	6.99	16.9
St. Kitts and Nevis	260	54,944	50	211.32	68.04	15,739	1.48	20.4
St. Lucia	620	183,645	30	301.06	81.52	7,648	2.80	19.7
St. Vincent and the Grenadines	390	109,360	50	280.41	49.80	6,673	7.76	20.2
Suriname	163,820	538,248	600	3.45	33.92	9,680	10.12	16.5
Trinidad and Tobago	5,130	1,354,483	250	264.03	91.45	21,317	0.43	6.2

Source: Compilation from World Development Indicators, World Bank 2016; FAO 2014

NB: Countries in bold are the five countries visited during the project

4.2 Employment

Employment statistics indicate that 29% of the people in the CARIFORUM region were counted as agricultural population in 2012 (FAO, 2014). This would correspond to a total of at least 8 million people in 2014, with a wide variation of percentages between countries. In 2012, rates of agricultural populations varied between less than 3% for Barbados and The Bahamas, and 15% or more for all other countries apart from Haiti, which had more than 50% of the population in agriculture (Table 3). They may correspond to about 6 million people employed, although these statistics come with a note of a caution, as there are large differences between various sources, and from one year to the next (FAO 2014, ILO 2015, World Bank 2016). **One feature common to all CARIFORUM countries, given the small extent of arable land, is the importance of small and family-run farms.** Unemployment averages 8% of the total labour force across the region (ILO 2016), varying between 4% and more than 20% in some countries such as Grenada and St Lucia (CARICOM 2016, World Bank 2016).

The sector's contribution to rural livelihoods in 2016 has also been increasing recently, maybe even more than the proportion of agricultural population indicates. In particular:

- There is a high level of informal work in agriculture, and a growing importance of subsistence farming, which is not recorded in the statistics;
- Government policies to reduce unemployment have specifically encouraged investment and agriculture production⁹, including subsistence agriculture;
- Government policies to reduce youth unemployment are successfully attracting qualified young entrants (Youth in Agriculture projects¹⁰);
- Government policies to foster links with Tourism¹¹ are also encouraging local food production;
- The proportion of women in the agricultural labour force is comparatively low (9%, FAO 2014) in the Caribbean, as a relatively larger percentage of women are educated and employed in the Service sector; but women in agriculture are more involved in value addition and create employment through short supply chains, on-the-farm food processing (jams, sauces, non-gluten flour, etc.), and cottage-industry linkages with tourism and agro-tourism;
- Private sector initiatives, such as from the Massy supermarket chain in St. Lucia, are providing small-holders with finance and technical support to improve crop planning and crop diversity, in order to address the chronic shortage of locally farmed fresh produce.

The most recent report on the Outlook for Agriculture and Rural Development in the Americas 2015-2016 (ECLAC FAO IICA, 2015) conjectures that small-scale production is set to grow:

- Demand from outside (US, European, and Asian—mainly Japanese) markets for wholesome, 'healthy' products with a smaller ecological footprint will grow; and

⁹ <http://www.caribank.org> and <http://www.agricarib.org/trends/details/486>

¹⁰ Regional FAO/IFAD/ CTA programme, <http://www.fao.org/3/a-i3947e.pdf>

¹¹ <http://www.iica.int/en/topics/agrotourism-and-rural-tourism>

- Domestic markets will grow and short food supply chains will increase, including farmers' markets, farm-gate purchases, and institutional purchases from family farmers, as governments promote and support the creation of short circuits for the marketing of crops as a means to integrate family farmers into formal markets (Box 1).

In order to meet these challenges, countries will need to strengthen the compliance of small-scale producers with SPS requirements. The IICA-led, EU-funded, Regional SPS Project¹² is one project focusing on this and also on TBT private trade standards of best practice, such as GlobalGAP, Fair Trade, and Organic, etc.

Box 1: Strengthen Family Farmers' Links with (Mainly) Domestic Markets in LAC

To enable smallholders to take advantage of the rapid growth of domestic markets, it is necessary, among other things to:

- Strengthen public and private programs designed to assist family farmers in complying with the standards and requirements, mainly related to quality and safety, established in government regulations and the standards of the principal distributors in food markets.
- Promote a business culture among family farmers through support for associative enterprises (mainly using favourable legal frameworks and incentives) and the creation of business skills.
- Afford family farmers access to productive assets and know-how that would enable them to improve their participation in markets. It is especially important that they have more access to differentiated financing, the production and marketing infrastructure, and market information.

Source: 2015-2016 Outlook Latin America and the Caribbean (ECLAC, FAO and IICA 2015¹³).

The marine capture sector is made up mostly of small-scale, multi-gear vessels. Several countries also have distant water fleets of larger vessels, mostly foreign owned and operated with limited economic ties to the countries, other than through licensing services.

4.3 Main trade value chains of relevance

Export of agri-food commodities by CARIFORUM countries totalled US\$3.43 billion in 2014 (9.5% of all exports), and imports US\$7.45 billion (16% of all imports). The balance of trade in agri-food products is highly negative (US\$4.03 billion) with imports more than twice the value of exports (Table 3).

In 2014, the top five exports were beverages and spirits, followed by fish, cereals (principally rice), sugar and fruits (including banana). The main imported products are cereals (HS Classification 19), beverages (HS Classification 22), and meat, poultry, and dairy products (HS Classification 04).

¹² <http://www.iica.int/en/projects/agricultural-health-and-food-safety-ahfs>

¹³ <http://caribbean.cepal.org/content/outlook-agriculture-and-rural-development-americas>

Table 3: CARIFORUM's international trade in agri-food products 2014 (US\$ million)

HS	Product label	Exported value in 2014	Imported value in 2014
	All products	36,198	46,948
HS	Agrifood products	3,427	7,455
02	Meat and edible meat offal	19	661
03	Fish and crustaceans, molluscs and other aquatic invertebrates	319	293
04	Dairy produce; birds' eggs; natural honey; other edible animal prod.	34	701
07	Edible vegetables and certain roots and tubers	154	259
08	Edible fruit and nuts; peel of citrus fruit or melons	514	193
09	Coffee, tea, maté and spices	49	86
10	Cereals	322	1,112
11	Products of the milling industry; malt; starches; inulin; wheat gluten	155	285
12	Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit...	13	157
15	Animal or vegetable fats and oils	69	554
16	Preparations of meat, of fish or other aquatic invertebrates	34	280
17	Sugars and sugar confectionery	364	344
18	Cocoa and cocoa preparations	259	71
19	Preparations of cereals, flour, starch or milk; pastry cooks' products	200	589
20	Preparations of vegetables, fruit, nuts or other parts of plants	154	384
21	Miscellaneous edible preparations	242	665
22	Beverages, spirits and vinegar	504	767
	Live animals and plants		
01	Live animals	16	25
06	Live trees and other plants; bulbs, roots and the like; cut flowers ...	7	27

Source: Compilation from ITC – TradeMap¹⁴

Most countries in the region import more than they export. Only Belize and Guyana run an agricultural trade surplus, but this appears to be declining. In 2008, imports by Haiti were reported to be over 30 times the level of exports; for Antigua and Barbuda, and St Kitts and Nevis, the ratio of imports to exports was around 20:1; and for The Bahamas, it was almost 15:1. In Barbados, Dominica, Jamaica, St Lucia, St Vincent and the Grenadines, Suriname, and Trinidad and Tobago, the 2008 level of imports was over twice that of exports¹⁵.

¹⁴. Figures from TradeMap are regularly updated and may therefore change slightly depending on the date of the query.

¹⁵. EU CTA, Caribbean: Agricultural trade policy debates and developments: Executive brief: Update, July 2011. <http://agritrade.cta.int/Agriculture/Topics/EPAs/Caribbean-Agricultural-trade-policy-debates-and-developments>

4.4 Main trade partners of relevance

Given the proximity of the US, this is the main trading partner for both the export and import of commodities subject to SPS measures. Table 4 shows the relative importance of the main global markets for the top five exported commodities from the region.

Table 4: CARICOM Export of selected agri-food products by destination in 2014

HS Category		US	Canada	EU	CARICOM	Rest of World
		(US\$ million)				
03	Fish, crustaceans, molluscs, etc.	147.220	17.016	40.545	31.079	68.952
08	Edible fruit and nuts; peel of citrus fruit or melons	26.628	3.362	63.939	4.996	5.221
20	Preparations of vegetables, fruit, nuts, etc.	32.169	2.154	22.087	42.27	2.990
21	Miscellaneous edible preparations	30.527	2.576	8.196	27.837	3.262
07	Edible vegetables and certain roots and tubers	20.622	6.704	6.311	12.092	1.165
09	Coffee, tea, maté and spices	9.100	2.716	9.604	4.512	11.296

Source: Compilation from ITC - TradeMap

A detailed trade analysis produced by CTA¹⁶ showed that 87% of the wheat imports into the CARICOM (Caribbean Community and Common Market) came from the US, along with 98% of maize imports and 79% of poultry imports (although the region is about 80% self-sufficient in this commodity). Agricultural exports tend to be more diversified. Traditional exports of bananas, sugar and rice largely follow colonial-era trade patterns and are destined for the EU. However, fruits and processed agricultural exports, including fishery, products tend to be directed more towards the US market. For the commodities selected in Table 4, the EU accounts for only 22% of CARICOM's agricultural exports.

4.5 Intra-Regional Trade

A major economic instrument of CARICOM is the customs union, which has established a Common Market and a customs union. All goods that meet the CARICOM rules of origin are traded duty-free throughout the region. In addition, most member states apply a Common External Tariff (CET) on goods originating from non-CARICOM countries. In 2013, intra-CARICOM trade in all goods amounted to US\$3.4 billion in imports and US\$3.6 billion in exports, including US\$0.15 billion of re-exports (CARICOM, 2015). The level was severely reduced by the global financial crisis in 2008, but has now largely recovered (as shown in Figure 2 overleaf). Intra-regional trade figures are still small compared to international trade volumes of US\$29.2 billion imported and US\$28 billion exported by CARICOM countries in 2013¹⁷.

Intra-Regional trade makes a significant economic contribution. Complementary to the free movement of goods is the guarantee of acceptable standards of these goods and services. To accomplish this, CARICOM members

¹⁶ CTA, 2015. 2015 Caribbean Pacific Agri-Food Forum (CPAF 2015), collaborative report

¹⁷ CARICOM figures include a small amount for Montserrat; International Trade figures in Table 3 are for all CARIFORUM countries.

have established the Caribbean Regional Organisation on Standards and Quality CROSQ) and most recently, in relation to SPS matters, the Caribbean Agricultural Health and Food Safety Authority CAHFSA). These bodies are responsible for the development of regional standards in the manufacture and trade of goods.

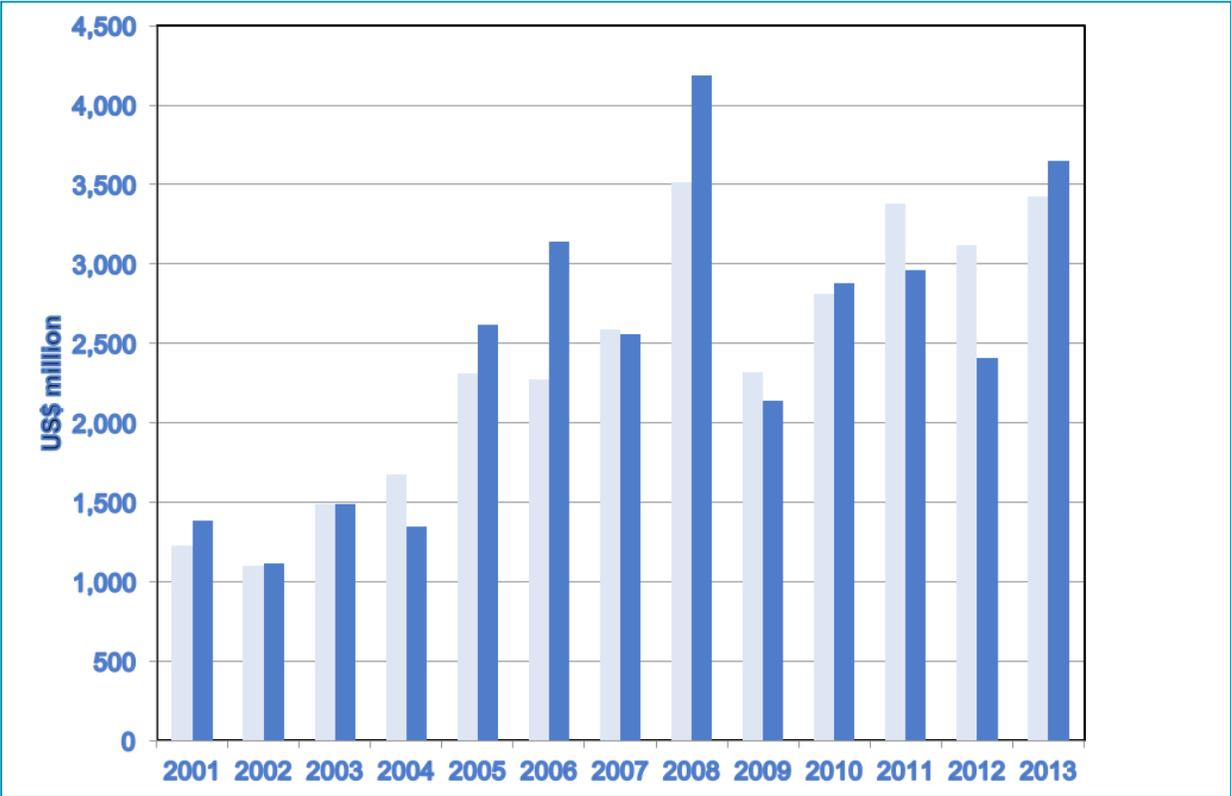


Figure 2: CARICOM's intra-regional trade 2001-2013

Source: CARICOM Secretariat¹⁸

4.6 Main issues in agricultural trade

In general, the region is severely challenged in terms of its agricultural production and food chain development. As well as having to overcome typical developing county issues of large numbers of small producers, under-investment in energy and distribution infrastructure, and lack of human capacity, most of the countries are small island states and also have to overcome remoteness and high cost of inputs and distribution to international markets. There are substantial problems of land and water management in much of the region, due to the variable rainfalls, soil types, steep topography in the islands, and variation in types of agricultural production systems. The region is highly susceptible to extreme weather events, which destroy crops, interrupt trade and can result in market exit. In the medium term, these impacts may worsen due to climate change, which may also induce changes to the marine ecosystems.

Several of these features impact on the SPS conditions and their control, for example the lack of human capacity and limited technical skills to design, implement and respond to (from the sector's point of view) SPS measures.

¹⁸ CARICOM'S INTRA-REGIONAL TRADE: 2008 – 2013, The Regional Statistics Programme, Caribbean Community (CARICOM) Secretariat 2015

One of the consequences is rejection of products consigned to export markets. Table 5 below shows recent rejections of products on entry to the EU. More information on rejection rates is provided in Section 6. Such rejections, whilst rather limited in number, undermine buyer confidence and risk the application of wider control measures applied by importing countries.

Table 5: Rapid alerts (border rejections) by the EU in 2016 of products consigned by CARIFORUM countries

Product category	Country of origin (O) and EU importers	Subject
Fruits and vegetables	Dominican Republic (O), France, United Kingdom	Unauthorised substance carbofuran (0.021 mg/kg - ppm) in bitter melons from the Dominican Republic
Fruits and vegetables	Dominican Republic (O), France, Italy	Unauthorised substance permethrin (0.39 mg/kg - ppm) in fresh peppers from the Dominican Republic
Fruits and vegetables	Dominican Republic (O), United Kingdom	Dimethoate (0.16 mg/kg - ppm) and unauthorised substance omethoate (0.10 mg/kg - ppm) in fresh yard long beans from the Dominican Republic
Fruits and vegetables	Dominican Republic (O), Italy	Dimethoate (9.53 mg/kg - ppm) and unauthorised substance omethoate (1.62 mg/kg - ppm) in fresh cowpeas (<i>Vigna unguiculata</i>) from the Dominican Republic
Fruits and vegetables	Dominican Republic (O), United Kingdom	Spinosad (0.16 mg/kg - ppm) and unauthorised substances carbofuran (0.02 mg/kg - ppm) and dithiocarbamates (0.15 mg/kg - ppm) in fresh aubergines from the Dominican Republic
Fruits and vegetables	Dominican Republic (O), Germany	Methomyl (0.4 mg/kg - ppm) in yardlong beans from the Dominican Republic
Fish and fish products	France, Suriname (O)	Red snapper (<i>Lutjanus spp</i>), Atlantic goliath grouper (<i>Epinephelus itajara</i>) and vermilion snapper (<i>Rhomboplites aurorubens</i>) from Suriname unfit for human consumption

Source: RASFF, DG Santé: https://ec.europa.eu/food/safety/rasff_en

The CARIFORUM region also has a number of specific challenges in relation to SPS measures in the form of specific hazards unique to the region (poisonous substances such as ciguatera in fish, hypoglycin A in ackee, annonacin in soursop seeds) and dependence on production systems that are highly susceptible to changes in climate and also to climate-associated changes in the prevalence of pest and disease risks (IICA, 2013), in particular bananas, coffee, and citrus and other fruits (ECLAC, FAO and IICA, 2015).

4.7 Tourism

The Caribbean region hosted an estimated 28.7 million visitors with overnight stays in 2015 (Caribbean Tourism Organization). The region capitalises on its strong cultural identity and relatively unspoilt environment, and has a strong reputation for local, high-quality tourist services. The sector is estimated to have contributed a total of

US\$52 billion to the Caribbean region in 2015, of which some 30% was in direct revenues. Overall contribution to GDP was estimated to be 16%, accounting for 2.7 million jobs, about 15% of the workforce (WTTC 2016).

Whilst SPS compliance (in the form of safe food) does not enhance tourism (since food safety is assumed to be a right) it is a *sine qua non* for a healthy tourism sector. There is a substantial reputational risk from non-compliance, and in recent history there are several cases in other regions where the tourism sector has been undermined by the high incidence of unsafe food resulting in tourist food poisoning (e.g. Egyptian Nile cruises). In recent years, there have been a number of well-publicised events in the region, involving significant direct costs in compensation as well as loss of business due to damage to the reputation of the operators and country concerned (for example major food poisoning outbreak at a tourist resort in the Dominican Republic¹⁹). Such events potentially undermine the economic benefits of tourism, not only in the country concerned, but also in the wider region. Strengthened domestic SPS conditions therefore have potential to deliver large benefits (albeit difficult to quantify) in terms of sustaining the tourism sector.

¹⁹. Tour operators pay out £5.5m compensation to 1,000 British tourists who suffered food poisoning on Dominican Republic holiday from hell, Daily Mail, <http://www.dailymail.co.uk/news/article-2367333/Tour-operators-pay-5-5m-compensation-1-000-British-tourists-suffered-food-poisoning-Dominican-Republic-holiday-hell.html#ixzz4W1xhEc8j>

5 STAKEHOLDERS AND STAKEHOLDER INTERESTS

5.1 Interests in SPS

It is important to appreciate that there are different and sometimes conflicting interests in the application of sanitary and phytosanitary (SPS) controls, which impact on the estimation of costs and benefits. These arise from the scientific fact that the nature of SPS hazards is such that there is no such state as 100% elimination of all risks. SPS hazards are essentially biological in nature, and subject to a range of external variables such as climate and genetically-derived biological variability (which is why they defy control by the standards/conformity assessment approach applied to industrial goods). They are also subject to variability in human influences, such as technological development, trade patterns and consumer habits. Given this immense set of independent and interacting variables that impact on SPS safety, and the limited available knowledge, no system can guarantee full safety. Hence, the objective of SPS control systems is risk management (rather than risk elimination) to achieve reduction of risks to a reasonable level.

The interests of the stakeholders determine the 'reasonable' level of risk. This presents one of the challenges in determining the costs and benefits of SPS controls; at what level of risk should the costs and benefits be estimated? Lack of data in the Caribbean (and other regions) precludes the possibility of determining optimal levels of control to maximise the cost benefit ratio. However, it is useful to explore in more detail the interests of different stakeholder groups, to reflect the need to find a balance between them in the investments made in control systems, and illustrate how this may impact on the overall costs and benefits of SPS control in the Caribbean region.

5.2 Consumers

First and foremost, one of the main objectives of SPS measures is to protect human health. This is clear in the risk management of food safety. Whilst animal and plant health disease controls are primarily in place to protect agricultural production systems, some elements also protect consumers (for example in relation to zoonoses and agro-chemical controls).

Most countries exercise, in law, their right to protect national consumers from hazards in the agricultural supply chain. National populations in CARICOM countries range in size from just under 55, 000 (St. Kitts & Nevis) to 10.5 million (Haiti), with a total of 17.7 million (Table 2). With the Dominican Republic, the CARIFORUM population is just under 28 million. Undernourishment rates in the region are about 20%, in Haiti it is nearer 53%. Food insecurity is therefore a challenge for many countries, reflected in the low-levels of self-sufficiency. In CARIFORUM countries, food imports, as opposed to national food production, are by far the largest source of food. In at least seven countries, 80% or more of available food is from imports²⁰. Food safety and food insecurity are strongly linked, in that consumers, through lack of access to stable food supplies, are often compelled to purchase lower cost foods, where there is a greater risk that safety is compromised. Furthermore, malnourished consumers are less able to resist the effects of substandard foods, being more liable to infections and suffer higher levels of illness and death.

²⁰ STATE OF FOOD INSECURITY in the CARICOM Caribbean Meeting the 2015 hunger targets: Taking stock of uneven progress. Food and Agriculture Organization of the United Nations, Bridgetown. Barbados. 2015

Whilst the most recent WHO burden of disease study suggests that overall in the region, the rates of food borne diseases are not as great as in some other developing regions, they are nevertheless substantial, with a major focus on diarrhoeal diseases (Figure 3). The WHO data also masks some within-region variations, where countries such as Haiti are known to have severe public health impacts due to unsafe food and water. In all cases, failures in SPS control systems can result in illness and death, and it is the consumers' main interest to avoid such impacts. These can be either acute, or chronic where disease impacts only become evident after continued exposure over time. In the case of some environmental toxins in food, the impacts of food safety failure may fall on future generations rather than the consumer, either the unborn (teratogenic effects) or nursing infant or, potentially, children yet to be conceived (in the case of mutagenic effects).

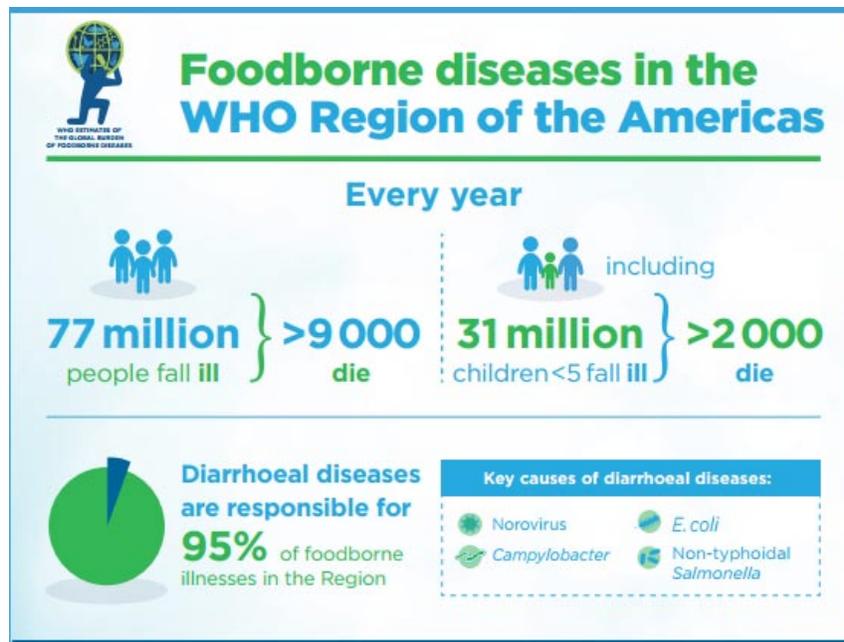


Figure 3: WHO Burden of foodborne diseases. 2015

As well as human suffering, food safety failures incur costs in lost production, increased health care costs, and cost of premature death, thus impacting on the national economy and public finances. In the US, a recent study by the United States Department of Agriculture (USDA) Economic Research Service estimated the cost of food poisoning from the top 15 hazards at US\$15.6 billion in 2013 (Hoffmann et al. 2015). Pro rata by population, this suggests that the current cost of food poisoning to the domestic population of CARIFORUM countries could be in the region of US\$1.4 billion/year.

As noted above, the interest of consumers is evident not only to national populations, but also to visitors and consumers in export markets. The Caribbean is often described as “the most tourism-dependent region in the world” and rates of dependency on this sector in some smaller countries are much higher than the average. The Caribbean Tourism Organisation estimated an increase to 28.7 million stopover arrivals in 2015. Given the importance of tourism to the economies of several countries in the region, food safety failures can have a major impact, not necessarily directly in terms of ill tourists, but also in terms of reputational damage impacting on future consumer choice of destinations.

Consumers in export markets supplied by CARIFORUM food and agriculture operators have an interest in the SPS measures applied to the production and marketing systems. In 2013, the region's top five exported agricultural commodities were cane sugar, shrimps, bananas, rum and orange juice. Trade partners that dominated CARIFORUM Members' export partners of goods subject to SPS measures were the US, other CARIFORUM countries, the European Union (EU) and other non-CARIFORUM Caribbean countries, suggesting the consumers of relevant products in these regions also have an interest in the efficacy of SPS controls.

5.3 Food and agricultural business operators

Producers, in the form of farmers and fishers, are the primary stakeholders in the SPS control system. However, SPS impacts also fall on upstream operators in the value chain (inputs suppliers, especially in the case of agricultural producers, bearing in mind that fish are, for the most part, hunted) and the downstream business operators who transform and distribute the products to consumers. The agri-food sector in the region is characterised by a small number of large specialist and vertically integrated operators (in commodities such as sugar, banana, etc.) and hundreds of thousands of small-scale operators, at all levels of the supply chain (farming, processing, distribution, trade, retail and catering). The CARIFORUM fishery sector is particularly important for its contribution to food security, poverty alleviation, employment, development and stability of rural and coastal communities, culture, recreation and tourism, as well as to foreign currency accounts from exports.

Here, it is important to express the different impacts of the SPS objectives of sustaining food safety, animal, and plant health. In the case of animal and plant health, the objective is to protect producers from the possible introduction and dissemination of pests and diseases, which can undermine their livelihoods. In this respect, the collective good of the operators is the objective of the SPS measure (as well as the welfare of animals), even though they may be applied individually (for example movement restrictions to prevent the spread of disease). In the case of food safety, business operators in the supply chain are subject to the controls to protect consumers. In all cases, however, it is the business operators who bear the costs of complying with the measure and, as such, their main interest is to ensure that the measures are indeed valid and proportionate to the risks to be managed. The costs borne are both investment (in terms of upgrades to systems, practices, and capacity) and operational, in terms of higher operating costs due to the need to sustain improved conditions (such as hygiene) and stricter levels of control and monitoring (HACCP and traceability).

The interests of private sector operators are represented by producer and sector organisations. They may be local (such a fishing cooperatives linked to a specific landing site), national (e.g. national producer or exporter associations, especially in the sugar, banana, and poultry sub-sectors). Associations have a clear role to ensure that SPS measures applied by their governments are effective, reasonable, and proportionate, and do not unfairly prejudice their members by impacting on competitiveness or access to markets whether domestic or international. They are particularly alert to the need to ensure a level playing field for SPS measures.

In some sectors, regional associations representing commercial interests in the agri-food industry have emerged. Examples are the Caribbean Banana Exporters Association (CBEA), the Sugar Association of the Caribbean and the Caribbean Poultry Association, which represent national associations in regional and international fora. Fisher Folk Organisations and Private Fishing Companies are represented at the CRFM (Caribbean Regional Fisheries Mechanism) Forum. In addition, many businesses, such as supermarkets, catering, and hotel chains, have a strong presence across the region, and have an interest in ensuring that a harmonised approach to SPS standards is adopted, to ensure efficiency in procurement and marketing across borders within the region.

5.4 National Competent Authorities

SPS measures are regulatory actions taken by sovereign governments, as WTO members, to use their legal powers to require business operators to ensure that the identified risks are managed in a cost-effective way. The measures are constrained by the SPS Agreement (as set out in a previous section), but within these constraints, states are largely free to determine the appropriate level of protection of their consumers and farmers. National competent authorities (CAs) are required to perform tasks related to SPS controls. Ideally states should be able to identify the CA responsible for risk management for each area of food safety, plant health and animal health and associated functions of inspection and laboratory testing to support the CA functions.

All CARIFORUM countries have in place at least some SPS measures and a lawfully enacted institutional framework for their implementation, although in many cases legislation needs updating. In most countries, animal health and plant health control functions are placed under the Ministry of Agriculture (respectively, veterinary and plant health functions, corresponding directly to implementation of OIE and IPPC standards). Here there is an interest to apply an effective sanctions regime to ensure that non-compliant operators either become compliant or, ultimately, are removed.

In many countries, food safety controls exhibit a colonial legacy, whereby control measures are contained within the legislation constituting the institution. Thus, Public Health Acts empower sanitary or public health authorities under the Ministry of Health, food safety controls for products of animal origin fall under the veterinary authority under the Ministry of Agriculture, those for fishery products fall under a fisheries function, and food product standards fall under a standards body constituted under a Ministry of Trade or Industry. Some control functions are also devolved to local governments.

As a result, food safety as a function can be spread across different ministries and levels of government, depending on the product, and no one authority is specifically responsible for overall food safety. Here, there is an interest to ensure effective coordination in the short term, and to revise institutional mandates in the longer term to ensure clearer allocations of responsibility. To this end, the current approach within CARICOM is to encourage a collaborative approach through a committee or other arrangement akin to National Agricultural Health and Food Safety Authority (NAHFSA) as the lead regulatory SPS stakeholder in each country, with a mandate to coordinate SPS matters.

It is also in the interest of all parties to avoid conflicts of interest when a single institution is responsible for developmental and regulatory roles with regard to a specific sector. Managing such conflicts in small nations with limited technical resources presents a particular challenge, and is a strong argument in favour of centralisation of food safety risk management functions.

It should also be noted that other institutional stakeholders also exist in CARIFORUM countries. Other authorities with valid interests in the emergence of an effective, efficient and proportionate SPS regime are:

- Ministry of Foreign Affairs and Foreign Trade
- Ministry of Industry, Commerce, Agriculture and Fisheries; Veterinary Services; Customs; SPS Competent Authority; Bureau of Standards
- Commodity Boards; National Investment and Export Promotion Agencies
- Ministry of Tourism

Competent authorities have an interest to access technical resources provided by testing laboratories, and research and educational institutions, to a high level of competence, as evidenced by accreditation to the ISO17025 standard. In relation to testing of fishery products, a recent survey reporting on the development of regional sanitary indicators²¹ found that just three laboratories in the region can provide food-testing services at this level; the Caribbean Industrial Research Institute (CARIRI) in Trinidad, Food Safety and Technology Laboratories in The Bahamas, and Fish Inspection Institute (VKI) in Suriname. For these stakeholders, the interest is to develop sustainable business models providing services to competent authorities and to invest further in extending the scope of testing to parameters required for food safety, particularly for important hazards such as aflatoxins, histamine, and ciguatera, where provision of testing services is weak at present.

In some cases, competent authorities have developed their internal laboratories, but in many of these, they have not proven to be financially sustainable, with little income from paid testing services and lack of justification for budget support. Here there is an interest to consolidate laboratory resources and ensure an optimal and economically viable provision of testing services (representing the demand in terms of type of test and location). As the private sector develops, the private laboratory services, such as TSL in Jamaica, may also seek accreditation and be available to support official controls.

Universities, education, and research institutions also provide essential services to the SPS system. They ensure that the human capital is sustained and strengthened by providing education and training services, not only for SPS control systems, but also for the agri-food sector, which also requires food safety professionals for the design and implementation of modern food safety controls systems such as HACCP and traceability. Research plays an important part in aiding in the understanding of hazards and, particularly, contributing to risk assessment related to specific Caribbean products and processes. Here, a strategically important stakeholder is the University of West Indies, a centre of excellence, which offers an MSc degree in Agri-Food Safety and Quality Assurance and an MSc degree in Tropical Crop Protection.

5.5 Regional bodies

Given the common challenges faced by agri-food business operators and competent authorities in all countries in the region, the role of regional bodies is becoming evident. Harmonisation of technical regulations, coordination of control systems, sharing of technical resources and capacity building through regional organisations all support and accelerate regional development, and are of particular importance for small island states with limited capacities.

In this context, the Caribbean Community, as a regional economic community, is of great importance as it aims *inter alia* to “create the environment for innovation, the development and application of technology, productivity, and global competitiveness, in which the collective strength of the Region is unleashed”. CARICOM provides the political arena for the development of a supra-national community with a single market and common external tariff. A key step towards this aim is the removal of non-tariff barriers, including through the harmonisation of regulatory requirements. CARICOM through its Secretariat is therefore actively working to develop a common SPS system, with harmonised national provisions and increased capacity, expressed in the Strategic Plan²².

²¹ Final Technical Report, Capacity Building of regulatory and industry stakeholders in Aquaculture and Fisheries Health and Food Safety to meet the SPS requirements of international trade, Report on behalf of IICA, Megapesca Lda, 2016

²² Strategic Plan for The Caribbean Community 2015 – 2019: Repositioning CARICOM, Vol. 1 - The Executive Plan, CARICOM Secretariat, Turkeyen, Guyana, 3 July 2014

CARICOM is developing its technical institutions. In this respect, the establishment in 2010 and operations from 2014, of the **Caribbean Agricultural Health and Food Safety Agency** (CAHFSA) is of great significance in providing the regional coordination on SPS measures. Its interest is to “perform a coordinating and organizing role for the establishment of an effective and efficient regional sanitary and phytosanitary (SPS) regime and to execute on behalf of Member States such SPS actions and activities that can be more effectively and efficiently executed through a regional mechanism.” CAHFSA has a strong interest in promoting the adoption and implementation of model agricultural health and food safety and fisheries legislation developed under the 10th EDF SPS project.

Another important regional stakeholder is the **Caribbean Regional Fisheries Mechanism** (CRFM), which has for several years supported the regional coordination and strengthening of food safety controls in the fishery sector. With the establishment of CAHFSA, with a food safety mandate, both parties now have a strong interest to collaborate and ensure a coordinated approach under the terms of a memorandum of understanding currently under discussion.

The **CARICOM Regional Organisation for Standards and Quality** (CROSQ), established in 2002 as the “regional centre for promoting efficiency and competitive production in goods and services, through the process of standardization and the verification of quality” is also a key stakeholder. Whilst standardisation and conformity assessment is not applicable to SPS measures directly, there is an interest in supporting the emergence of competent inspection and testing services. In particular, CROSQ supports the development of regional and national testing capacity for food safety parameters, and the implementation of ISO17024 and 17025 standards.

The **Caribbean Public Health Agency** (CARPHA) provides public health laboratory testing in support of surveillance, prevention, promotion, and control of important public health problems in the Region. It also coordinates responses to transboundary public health crises in the Caribbean and provides public health capacity building to enhance national capacities to deliver public health goods and services. Food safety is one of several areas of public health in which it is involved, which also includes nutrition, environmental health, mental health and family and community health.

The **Caribbean Agricultural Research and Development Institute** (CARDI) has an interest in undertaking scientific research which underpins SPS measures, for example in relation to pest risk management, animal diseases and food processing technologies.

The **Caribbean Plant Health Directors** (CPHD) Forum is a regional body dedicated to the coordination of phytosanitary matters in the CARIFORUM region. One of the main tasks performed is communication and the transparent exchange of information regarding plant pest risks among Caribbean countries. One of the means of promoting this exchange is through individual and group interchange of information via the annual CPHD Forum Meeting. It has five technical working groups, focusing on the following areas: Emergency Preparedness, Palm Pests, Fruit Fly, Molluscs and Safeguarding.

The **Caribbean Animal Health Network** (CaribVET) is a collaboration network involving veterinary services, laboratories, research institutes, and regional/international organisations to improve animal and veterinary public health in all the countries and/or territories of the Caribbean. The global objective of the regional network is to improve the regional sanitary situation and to contribute to the harmonisation and reinforcement of animal disease surveillance and control activities in the Caribbean in order to promote commercial exchanges in the area and human health.

5.6 Development partners

The EU as co-signatory of the Cotonou Treaty establishing the EU-ACP cooperation, is an important development partner, with an interest in supporting the development of a regional Caribbean Community trading bloc. The EU supports the strengthening of SPS conditions with the 10th EDF SPS project (EUR11.7 million). This Project is implemented by the Inter-American Institute for Cooperation on Agriculture.

6 COMPLIANCE IN STRATEGIC EXPORT MARKETS

Clearly, the requirements of the most strategically important markets set out in Table 4 (i.e. the US and the EU) need to be considered when assessing measures to ensure compliance. This is particularly the case when deciding on SPS requirements. Although some of these markets have similar requirements (for example the requirement for HACCP in seafood processing is a requirement of both the EU, Canadian and US regulatory authorities), in some other areas they may vary (for example in the maximum levels of permitted pesticides). Furthermore, it is not only the standards which may vary but, as we shall see, the way in which compliance is verified, for example in the requirements for certification.

Gaps between best international practice, as described in Section 3.4, and existing SPS systems in CARIFORUM countries persist for diverse reasons, and a detailed analysis against a common benchmark (for example Codex), for each country, each main market and commodity, is not the purpose of the study.

However, for cases of non-compliance, it is necessary to identify the causes and extent of non-compliances with a view to estimating the costs of activities needed to restore compliance. Furthermore, there is also some merit to looking at the problems of non-compliance across different commodities and markets, in order to identify structural challenges across CARIFORUM countries and the benefits of regional capacity building. This section therefore considers the nature and extent of SPS non-compliances in more detail, and requirements for their correction.

6.1 Non-compliance

There is no overall review of the current level of compliance with SPS measures for all CARIFORUM countries, but there are numerous studies looking at specific aspects of national capacity and needs.

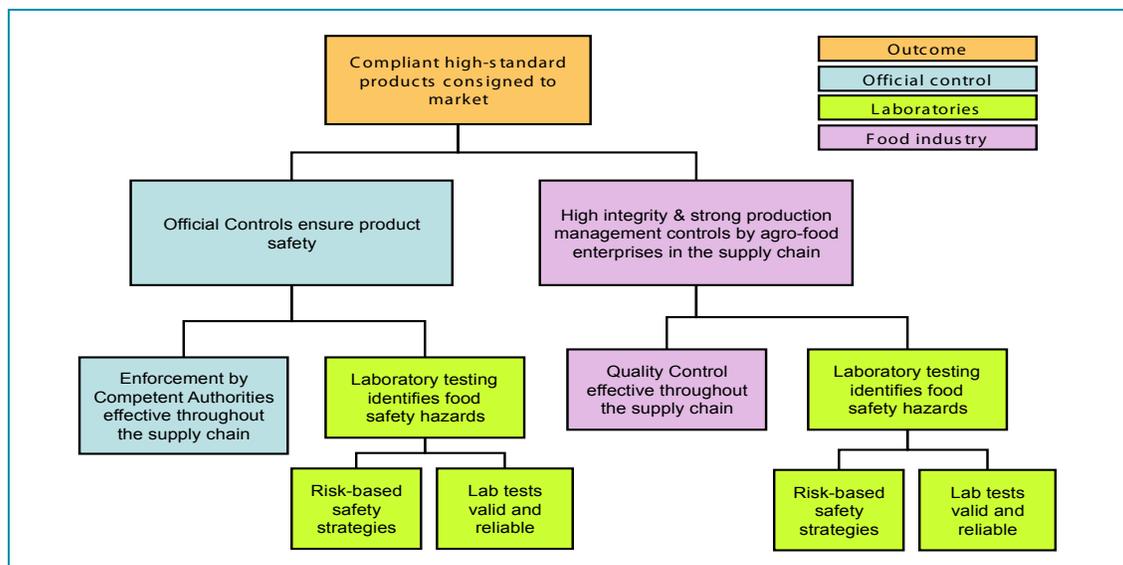


Figure 4: Essential components of a national SPS compliance system

SPS systems are multi-dimensional and therefore have multiple reasons to fail. Consequently, the trade impacts and causes of non-compliance in terms of food safety, animal and plant health may be diverse and wide ranging. A simple framework for considering how different factors combine to achieve compliance is proposed by the consultants and illustrated in Figure 4, and considers, separately, the responsibilities and duties of the public and the private sectors.

The responsibility of government ministries and agencies is to ensure that official controls are in place, that they are based on scientific and technical evidence provided by competent and certified laboratories, and that the SPS system is enforced through the whole supply chain.

The responsibilities of the food industry, private sector producers, processors, traders, and exporters, is to ensure that production steps are well managed, that national regulations are met and that, in the case of exporters, the SPS standards set by their destination markets are complied with.

It is instructive to make a comparison of the two main markets for CARIFORUM countries agri-food exports, the EU and the US, in the way they enforce the SPS standards on imports. The two systems share equivalent best practices for food business operators, from primary producer to retailers that have to comply with good hygiene practices (part of so called prerequisite programs or 'PRPs') and, except for primary producers, procedures based on HACCP. These are the basis for a food safety management system to ensure the safe production of food by preventing contamination with biological, chemical, or physical hazards, even though they are sometimes perceived as laborious, creating a disproportionate administrative burden for small to medium size establishments (SMEs). Although the standards may be considered in many cases equivalent, the authorities use different systems to inspect and enforce them in the countries of origin.

Generally, for high risk products (products of animal origin, plus some selected commodities) the EU relies on 'green lists' of authorised countries, exporters, processors, and producers, which place the responsibility on competent authorities of exporting countries to restrict trade to products that have been authorised by the national competent authorities.

By contrast, responsibilities for compliance with technical requirements of US regulations are placed on the importer (for example in making legally binding declarations that a HACCP system is operated by the exporter, in the country of origin). In addition, the US may rely on 'red lists' of companies that are not allowed to export to the US, and whose products will be systematically detained as they enter the US. However, for products controlled by the Food and Drug Administration - FDA (excluding meat, poultry, eggs and some farmed fish), new arrangements have been recently introduced by the Food Safety Modernisation Act of 2011, which increases the role of the FDA in direct inspection of establishments exporting to the US (see Section 6.5) as well as placing stricter requirements along the supply chain, including implementation of a formal preventive control programme.

These differences in approaches mean that exports into the EU can be severely limited by the capacity of national government agencies, while trade into the US may not, if private companies can demonstrate that they have a strong SPS control system in place.

6.2 EU and EU Member States import control systems

The current EU approach to import controls varies by commodity group. Live animals, products of animal origin, plants and plant products have specific systems. Wild fisheries products, for example, have to be landed at places that are subject to sanitary controls.

EU entry points (border inspection posts at ports, airports) are approved for the import of different categories of food and feed. A common entry document (CED) has to be submitted for all consignments to a designated point of entry (DPE) at least one day prior to consignment arrival. In all cases a three-stage check is mandated: documentary, integrity and physical. Physical checks, including sampling and testing will be carried out in accordance with frequencies matching the SPS risk. Many consignments are allowed entry on the basis of documentary and integrity checks alone.

6.2.1 Live animals, food and feed products of animal origin, and live plants

A higher level of origin control is placed on high-risk categories of products, thus live animals, food and feed products of animal origin, live plants and certain other high SPS-risk products are only permitted entry when they are derived from countries with approved food safety, animal health or plant health control systems, which are considered to be “at least equivalent” to those in the EU. These decisions are based substantially on audits of the third countries’ control systems carried out by the European Commission’s Food and Veterinary Office (FVO). These reports, which provide an accurate account of the status of SPS control systems (including EU Member States, which are also subject to audit) can be reviewed at: http://ec.europa.eu/food/audits-analysis/audit_reports/index.cfm

6.2.2 Feed and food of non-animal origin

Imports of feed and food of non-animal origin from any source are permitted, but they are controlled through a system of checks (official controls) aimed at making sure that products identified as presenting a risk to health meet European Community standards. These checks on high risk food and feed impose a parallel regime to that in place for veterinary checks, requiring that checks are carried out at a designated port, which has been approved to handle the product concerned. Higher levels of control can be specified in regulations where specific risks are identified (for example in relation to aflatoxins in various types of nuts, as set out in Commission Regulation (EC) No 669/2009 on an increased level of official controls on feed and food of non-animal origin) and varying control responses are defined (for example setting different levels of physical checks).

Inclusion of certain imports in high-risk categories set out in the regulation is the outcome of a decision of the Commission and EU Member States, in their role of risk managers. It is based on the latest scientific and factual information available, including RASFF notifications, findings of the audits carried out in third countries by the FVO of the Commission, scientific opinions of the European Food Safety Authority or of any other relevant scientific body, as well as information supplied by third countries’ competent authorities (Article 2).

The list of imports of feed and food of non-animal origin subject to an increased level of border surveillance is reviewed on a quarterly basis, from submissions by EU Member States of the results of the controls performed by their control authorities. Controls on imports of food and feed, in relation to pesticide contamination has a specific regulatory regime, which consolidates the list of food and feed subject to emergency controls at the port of entry, in relation to pesticide contamination.

6.3 Requirements applicable to food business operators

Essentially, because of the requirement for at least equivalence in relation to imports of food and feed from third countries as set out in EU Regulation (EC) No 178/2002, "*laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety*", business operators in third countries must meet EU requirements, or if they do not, be able to prove that their controls are at least equivalent.

Thus, all of the requirements set out in the 2004 'food hygiene package' comprising Regulations 853/2004 and 853/2004 and subsidiary legislation, set the conditions with which they should comply.

These regulations contain the basic food hygiene and HACCP requirements, as well as a range of compositional requirements intended to place limits on the presence of various food safety hazards such as aflatoxins, shellfish poisons, histamine, heavy metals, etc., many of which are directly applicable to exported products from the CARIFORUM region.

6.4 EU inspections

The European system relies on approval of food production and processing establishments. The responsibility for trade SPS-readiness first lies with the national competent authority of the exporting country to have adequate capacity to screen both establishments and products for export²³. The responsibility for the inclusion of establishments on the list falls to the national competent authority, and therefore EU controls consider the equivalence to EU regulations of the nationally nominated CA and its control systems. The inspections made by the FVO of the Commission therefore address national legislation, training and technical capacity of inspectors, scope and implementation of the inspections, and 'official controls', including certification. They consider specifically, actions taken in cases of non-compliance and the technical capacity of laboratories (as evidenced by the accreditation to ISO 17025). This is a highly onerous set of requirements, meeting which often requires high level policy support, budgetary commitment, changes in legislation, and technically driven investment in the control system over a substantial period. Many countries wishing to export products such as fish, dairy products, etc. to the EU have not been able to do so because of the lack of public sector capacity, irrespective of the standards of industry and the products that they produce. By way of example, Table 6 shows a profile of the current status of CARIFORUM countries in relation to export of fishery products to the EU. Only 7 out of 15 countries have access to the EU market for fishery products (i.e. can be considered to have controls at least equivalent), covering 54 processing establishments and 28 freezer/factory vessels. Only three laboratories meet the accreditation conditions.

²³ http://ec.europa.eu/food/safety/international_affairs/trade/non-eu-countries_en

Table 6: CARIFORUM countries sanitary controls for fishery products: Regional indicators of status (December 2016)

Indicator	Value
% of countries with CAs nominated for fishery products (=10/15)	67%
% of countries authorised to supply the EU with:	
• fishery products = 7/15	47%
• aquaculture products = 3/15	20%
• live bivalve Molluscs, etc. (e.g. conch) = 1/15	7%
No. of approved processing establishments + cold stores	54
No. of approved freezer vessels + factory vessels	28
No. accredited laboratories	3
No. of food safety tests within accreditation scope	9

For the foreign establishments allowed to exports to the EU, the frequency of in-country audits by EU teams is based on an analysis of risks from border interceptions²⁴. Serious cases of non-compliance may lead to legal action, restrictions or even bans on the movement of goods or animals. Past and planned audits are indicated on the European Commission website, with the audits reports of completed audits.

Between 2010 and 2016, only two Caribbean countries were inspected²⁵. Five audits have been conducted in the Dominican Republic regarding plant pest and pesticide contamination, and one audit in Suriname regarding fisheries products.

6.5 US import control system

6.5.1 Non-Meat Food Products

The Food and Drug Administration (FDA), is the food regulatory agency of the US Department of Health and Human Services for Non-Meat Food Products (Cereals, fish, produce, fruit juice, pastas, cheeses, etc.). FDA is also responsible for the safety of drugs, medical devices, biologics, animal feed and drugs, cosmetics, and radiation emitting devices. Since December 2003, the Bioterrorism Act (Public Health Security and Bioterrorism Preparedness and Response Act of 2002) requires that:

- All food facilities exporting to the US register with FDA, and that
- FDA be given advance notice on shipments of imported food.

²⁴ http://ec.europa.eu/food/audits_analysis_en

²⁵ http://ec.europa.eu/food/audits-analysis/audit_map/america.cfm#topmap

The FDA Food Safety Modernization Act (FSMA) enacted on January 4, 2011, aims to ensure the US food supply is safe by shifting the focus from responding to contamination to preventing it. It therefore increases the requirements for import verifications. Generally, all facilities engaged in manufacturing, processing, packing, or holding food for consumption in the United States, have to:

- Submit additional registration information to FDA, including an assurance that FDA will be permitted to inspect the facility at the times and in the manner permitted by the Federal Food, Drug, and Cosmetic Act (FD&C Act).
- Section 415 of the Act, as amended by FSMA, also requires food facilities to register with FDA and renew such registrations every other year, and
- Provides FDA with authority to suspend the registration of a food facility in certain circumstances.

FSMA requires FDA to immediately increase inspections of both foreign and domestic food facilities, including manufacturers/processors, packers, re-packers, and holders of foods under FDA jurisdiction. The FSMA mandates an inspection frequency of food facilities based on risk. Within one year of enactment, the law directed FDA to inspect at least 600 foreign facilities and to double those inspections every year for the next five years. In Jamaica, for example, 18 inspections were conducted in July and August of 2016 alone (Andre Gordon²⁶). FDA's foreign surveillance inspections are designed to identify potential food safety problems before products arrive in the United States, to determine the compliance status of facilities with FDA's requirements and food safety standards.

The routine inspections are designed to evaluate a facility's adherence to applicable US laws. They are not designed to assess a competent authority's food safety system, which is an important difference with the EU's inspection system just described (Section 6.4).

The FDA also requires prior notice of import shipments, and to report the name of any country to which the article has been refused entry. Together, the provisions aim to coordinate with the US Customs and Border Protection (CBP) and target import inspections more effectively.

In essence, similar requirements will apply to foreign facilities as for those in the US, with the responsibility placed on importers, whether food processors or not, to obtain the necessary assurances and checks. The FDA FSMA rule on Foreign Supplier Verification Programs (FSVP) for Importers of Food for Humans and Animals has been finalised. FSVP importers have to be ready for FDA inspection by mid-2017, at the latest. FDA intends to implement "as soon as possible" the third-party auditor certification program for US importing companies, regardless of size. That final rule was published in November 2015.

The other FSMA rules have staggered deadlines, but companies will generally have between one and three years following publication to comply, depending on their number of employees or average annual sales volume.

Finally, in the context of increased efforts to reduce illegal, unreported and unregulated (IUU) fishing activities (a non-SPS technical barrier to trade, but which contains similar origin certification requirements), the US government has just introduced (effective 9 January 2017), new traceability requirements for importers of fisheries products. Specifically, the rule revises existing requirements for the importer to file electronically through ACE data (and to retain records supporting such filings), to include information on the harvest of fish

²⁶ <http://www.foodqualityandsafety.com/article/handling-food-safety-issues-paradise-part-1-caribbean/>

and fish products. The rule also requires retention of additional supply chain data by the importer and extends an existing requirement to obtain an annually renewable International Fisheries Trade Permit (IFTP) to the fish and fish products regulated under this rule²⁷.

6.5.2 Meat, poultry, egg products and catfish

The Food Safety and Inspection Service (FSIS), the public health agency in the USDA, regulates the import of meat, poultry, and egg products. FSIS ensures that the US commercial supply of meat, poultry, and egg products is safe, wholesome, and correctly labelled and packaged. Its SPS system is more similar to the EU system than the FDA's, with green lists'. Since March 2016²⁸, FSIS' remit also includes siluriformes (catfish, including *Pangasius* spp.). In 2016, no CARIFORUM countries were eligible to export meat, poultry, or egg products to the US²⁹, but under the new FSIS provisions for catfish, the Dominican Republic and Guyana submitted lists of aquaculture establishments (23 altogether), which had previously exported siluriformes to the US. They have also submitted documentation to FSIS showing that they have laws or other legal measures in place that provide authority to regulate the growing and processing of catfish, which are compliant with the Food and Drug Administration's regulatory requirements (in 21 CFR part 123, Fish and Fishery Products). By the end of the transitional period to 1st September 2017, the countries will have to submit adequate documentation showing that their inspection system are equivalent with that of the United States. This new level of SPS controls currently being introduced demonstrates the increasing importance of strengthening national SPS control systems, to ensure that they are fully equivalent with the demands of the export markets.

6.5.3 Food establishments

The FDA has published a revised regulation (part 117) on "Current Good Manufacturing Practice (CGMPs), Hazard Analysis, and Risk Based Preventive Controls for Human Food (PCHF)."³⁰ The PCHF requirements implement the provisions of the FDA Food Safety Modernization Act (FSMA), which are that all agri-food businesses should have:

- A written food safety plan (FSP);
- Hazard analysis;
- Preventive controls;
- Monitoring;
- Corrective actions;
- Verification; and
- Associated records.

Very small businesses (averaging less than US\$1 million per year, adjusted for inflation, in both annual sales of human food plus the market value of human food manufactured, processed, packed, or held without sale) have a derogation of three years to comply from 1st January 2016.

²⁷ <https://www.gpo.gov/fdsys/pkg/FR-2016-12-09/pdf/2016-29324.pdf>

²⁸ USDA FSIS Notice 09-16 2/3/16

²⁹ https://www.fsis.usda.gov/wps/wcm/connect/4872809d-90c6-4fa6-a2a8-baa77f48e9af/Countries_Products_Eligible_for_Export.pdf?MOD=AJPERES

³⁰ <http://www.fda.gov/downloads/Food/GuidanceRegulation/GuidanceDocumentsRegulatoryInformation/UCM517610.pdf>; <http://www.fda.gov/Food/GuidanceRegulation/FSMA/ucm334115.htm> and <https://www.federalregister.gov/documents/2015/09/17/2015-21920/current-good-manufacturing-practice-hazard-analysis-and-risk-based-preventive-controls-for-human>

6.6 EU and US Border rejections

In terms of impacts of SPS, a study of border rejections reports for food/agriculture/fishery products from CARIFORUM countries is material, in that it provides valuable insight to understand the nature and level of non-compliance with SPS standards. This is not to say that the only impact of non-compliance is border rejection. As we shall see, border rejection rates are often minimal. A low number of rejections does not necessarily mean that the SPS system in the country is effective. It could simply mean that the country does not export much, or that products comply without the need for effective controls (for example due to a generally good plant health environment). Furthermore, even where there is a rejection, the damage to trade arises from the impacts on business confidence (which determine volume and price) where the main impacts of non-compliance fall.

Statistics on border rejections are published by the regulatory agencies of the importing countries (EU DG Santé, RASFF and FDA Import Alerts) and can be compared to the volumes of the main commodities concerned. The UNIDO Trade Standards Compliance Report 2010 proposed a summary measure using this data, the Relative Rejection Rate Indicator (RRRI), which weighs the number of rejections by the volume of imports, and therefore makes it possible to compare rejection data across export markets, across commodities and between countries, even with those having small export volumes.

The RRRI applies the data according to the following scheme:

- Countries with zero rejections are labelled 'none - N'.
- For countries with non-zero rejections, the ratio is converted into natural logarithms in order to generate a normal distribution; the natural logarithms are divided into three equal groups; Countries are then labelled as follows:
 - Highest tercile: 'high - H'
 - Middle tercile: 'medium - M'
 - Bottom tercile: 'low - L'

6.6.1 Differences between EU and US rejection rates

The RRRI values for CARIFORUM countries, over the period 2002-2010 exports to the EU and the US (UNIDO³¹) are shown in Table 7 for three main commodity groups; Fisheries products (HS 03), Fruit and Vegetables products (HS07 and 08), and Spices (HS09). The summary shows that between 2002 and 2010, all CARIFORUM countries (except for Antigua and Barbuda with zero rejections), had some instances of non-compliance in either the EU or the US market or both. A blank in the table indicates a lack of exports (Spices HS09 for Antigua and Barbuda, The Bahamas and St Kitts and Nevis).

A high RRRI value (H) over 'All' product categories indicates a relatively poor SPS compliance performance. For example, Dominica, the Dominican Republic, Haiti, St Kitts and Nevis, St Lucia, and St Vincent and the Grenadines, all have a High RRRI for the US market. By contrast, 'N' indicates the absence of rejections, and a low RRRI (L) over 'All' products, such as for Guyana and Jamaica exports to the EU, or The Bahamas and Belize exports to the US indicates relatively good compliance. Some important differences in regulatory requirements between the EU

³¹ UNIDO, 2011 and 2015. What do Border Rejections tell us about Trade Standards Compliance of Developing Countries? Analysis of EU and US Data 2002-2008, Working Paper prepared by Spencer Henson and Edward Olale; Meeting Standards, Winning Markets, Trade Standards Compliance 2015, UNIDO, Trade Capacity Building Branch.

and the North American (US and Canada) markets have been described in previous sections. In particular, the 'red list' approach in the US may make it easier for smaller companies and for more companies to export. If more companies export, the risk of rejection increases, even for similar overall quantities. Guyana, for example, has 'No' rejections of Fish and Fish products (HS03) by the EU, but a lower compliance 'Medium' score by the US. Such differences can reflect different SPS policies (such as a greater or lesser focus on allergen labelling). Guyana has registered only four processing establishments for EU supply, authorised since 2012. By contrast, at least another 18 Guyana fish-exporting companies registered with FSIS in 2016, on the basis that they have exported to the US before (Table 7).

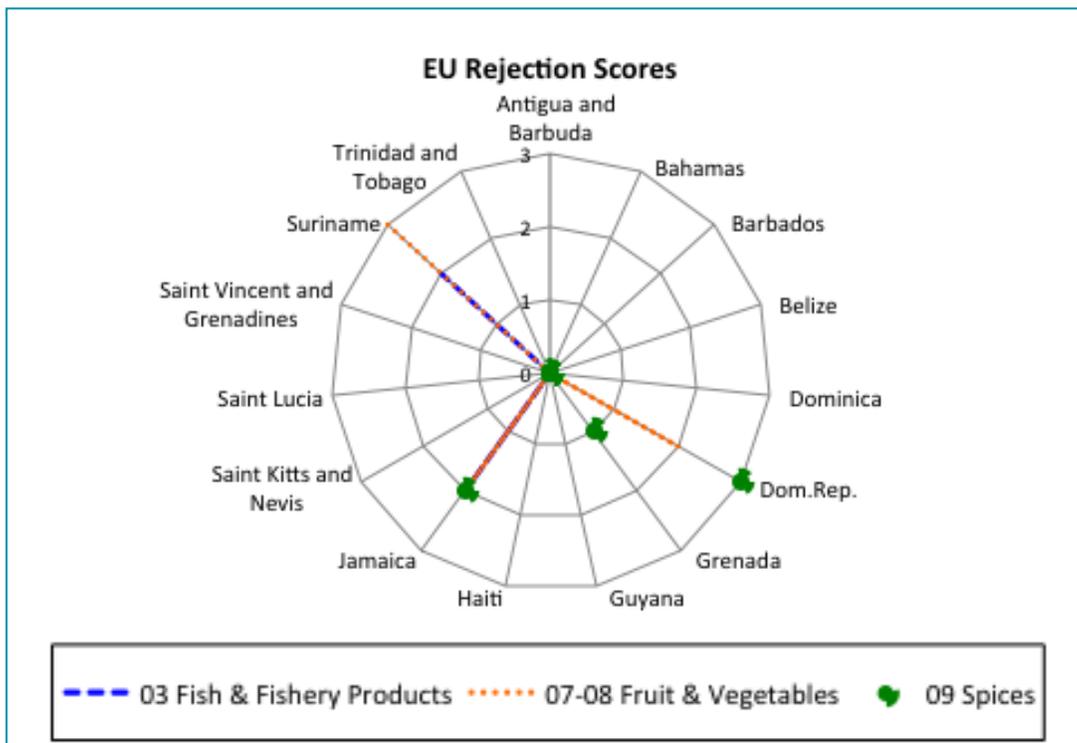
Table 7: Relative rejection rate indicator (RRRI) at the EU and US borders (2002-2010)

Market and Harmonised system N° Countries	EU	03	07-08	09	US	03	07-08	09
Antigua and Barbuda	N	N	N	N	N	N	N	
Bahamas, The	N	N	N	N	L	L	N	
Barbados	N	N	N	N	M	M	H	H
Belize	N	N	N	N	L	L	N	N
Dominica	N	N	N	N	H	H	H	N
Dominican Republic	M	N	M	H	H	M	H	H
Grenada	M	N	N	L	M	M	H	L
Guyana	L	N	N	N	M	M	H	H
Haiti	M	N	N	N	H	H	L	H
Jamaica	L	M	M	M	M	M	M	M
St. Kitts and Nevis	N	N	N	N	H	N	N	
St. Lucia	N	N	N	N	H	N	H	N
St. Vincent and the Grenadines	N	N	N	N	H	H	M	N
Suriname	M	M	H	N	M	M	N	N
Trinidad and Tobago	N	N	N	N	M	L	M	H

Source: UNIDO (2015) N=no rejection, RRRI: H=high, M=medium, L=low, blank=no export

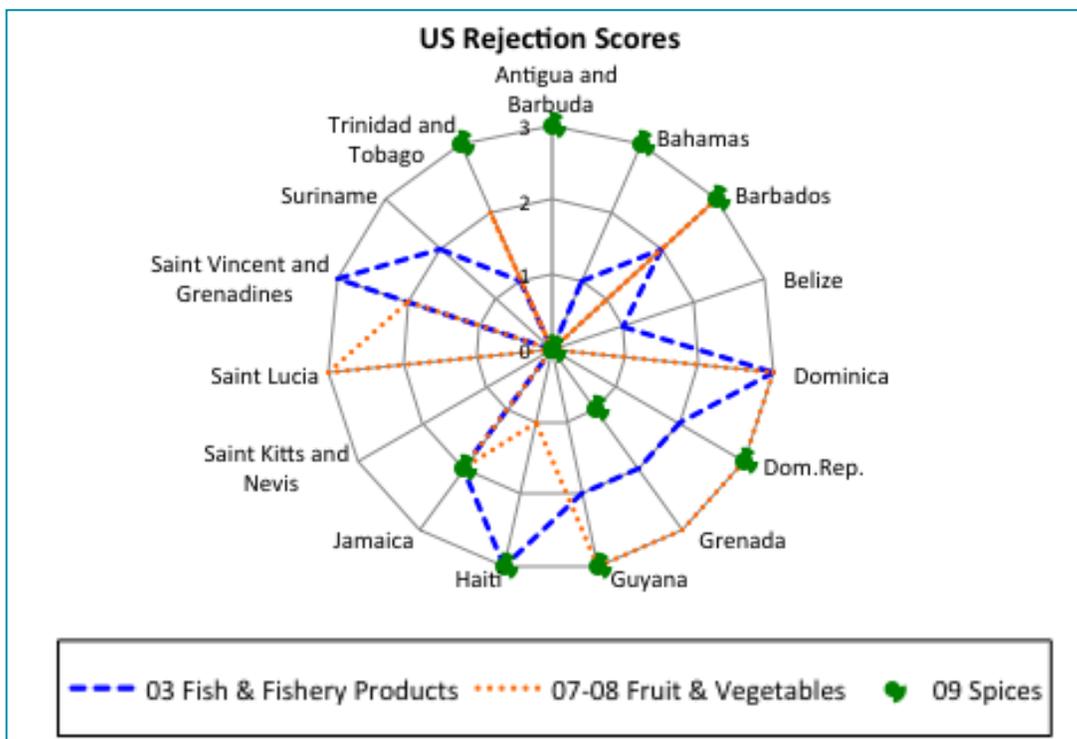
However, several producers and exporters interviewed during the country visits, over a variety of commodities, noted the complications and higher costs involved with exporting to the EU compared with the US. In any case, the EU SPS systems requirements appear more effective, since they lead to lower relative rejection rates across the three commodity groups considered. However, the SPS controls also deter some operators.

For each of the EU and US markets, RRRI also show differences between commodity groups. The same data is illustrated differently in Figures 5 and 6 overleaf. The relatively low compliance (RRRI High=2 and Medium=1) for fruit and vegetables (HS07-08) exported to the US by most CARIFORUM countries is remarkable. The Dominican Republic, Grenada and Jamaica have the same RRRI scores in both EU and US market. Otherwise rejection rates are higher for fruits and vegetables at US borders, and more CARIFORUM countries are concerned. Higher rejections for fruits and vegetables are likely to arise from commodity-specific food production practices and food safety risks, in this instance, rejections are mostly due to pesticide residues or 'filth' such as insect parts (UNIDO, 2015).



Source: UNIDO (2015) 2002-2010 no rejection or no export=0, RRRI: 3=High, 2=Medium, 1=Low

Figure 5: Rejection scores (RRRI) for CARIFORUM countries exports to the EU



Source: UNIDO (2015) 2002-2010 no rejection or no export=0, RRRI: 3=High, 2=Medium, 1=Low

Figure 6: Rejection scores (RRRI) for CARIFORUM countries exports to the US

Regarding the differences between rejection by the EU and the US markets, three important points are worth noting:

1. There are some commodity-specific challenges common in both the EU and US markets. These may arise either from national SPS compliance systems that have been developed separately for different commodities, or from commodity-specific SPS challenges, such as pesticides residues in fresh fruit and vegetables, and spices.
2. Compliance through a strong national competent authority provides good country-level compliance for the EU market for most CARIFORUM countries, but is not sufficient for the US market, suggesting a lack of implementation of official export controls to non-EU destinations.
3. The US market requires good production practices at exporter, processor, or farm-level; whatever the size of the exporting business.

UNIDO also performs periodic surveys of corporate buyers' compliance confidence and Trade Standards Compliance Capacity (2010 and 2015)³², but hasn't done these for the Caribbean region yet. Still, their most recent analyses for main traded commodity groups show that all CARIFORUM countries (except Antigua and Barbuda) have instances of non-compliance in the US market, and 6 of 15 have non-compliances in the EU market. Importantly, to increase benefits from international trade, the countries with 'Medium' and 'High' rejection rates would obviously need to strengthen their SPS systems.

6.6.2 Commodity-specific non-compliances

The detailed data analysed from the UNIDO study concerns export of Fish and Fish products (HS03). Fruit and Vegetables (HS07-08) and Spices (HS09) between 2002 and 2010. Looking into the diversity of US rejections, even in current FDA import alerts (to January 2017), some factors of non-compliance have remained common across several countries; others are still common across commodity groups. Table 8 provides a list of the current import restrictions for agri-food and fisheries products, based on incidents that may go back more than 10 years, but were potentially serious or recurrent enough for specific products and companies to remain red listed and systematically refused entry (Detained without physical examination – DWPE).

The alerts are organised by product, such as conch meat, or by product group (raw agricultural products), depending on the risk posed. In all, the Dominican Republic currently has the most alerts on its products imported into the US: 15 for agri-food products, and 2 for seafood products (lobsters and conch). The import alerts help to build the risk-based inspection programmes. They are also helpful to the countries concerned in identifying the most important risks that, even on their own, would have the potential to temporarily bankrupt an industry or to incur large public health costs.

Crossing the import alert information with the border rejection records and the refusal charge codes, it is also possible to obtain the number of shipments turned down for each live alert (Table 9). The details available between May 2014 and July 2016 (26 months,) show that 255 shipments of various seafood (fish, shrimp) from Guyana were refused entry under the alert code 249 'FILTHY', which is short for "the article appears to consist in whole or in part of a filthy, putrid or decomposed substance or be otherwise unfit for food." More worrisome

³² See: UNIDO "Meeting Standards, Winning Markets – Trade Standards Compliance" <http://www.unido.org/tradestandardscompliance.html>

is the risk of Salmonella from lobsters, with 7 shipments exported by red listed suppliers, in Haiti and in The Bahamas. The port of entry into the US, and the name and address of the exporter in the country of origin are also available. The supplier will have to submit regular bacteriological analyses over a number of months in order to be taken off the red list.

Table 8: US Import alerts (Detention without physical examination) from CARIFORUM countries

Countries	Agri-food	Fisheries related	Import Alert	Suppliers
Antigua and Barbuda	0	0		
Bahamas, The	4	2	Shark and Tuna for Methyl Mercury; Presence of Salmonella in lobsters; allergen rum cake; misbranding; Food colouring in cake (green list)	Red list; Green list
Barbados	1	0	Food colouring	
Belize	2	0	Ackee, poisonous; Raw Agricultural Products for Pesticides	Green- Yellow lists; Red list
Dominica	1	0	Tamarind Products (Fresh and/or Processed) from All Shippers from All Countries Due to Filth	Ban
Dominican Republic	15	2	Raw Agricultural Products for Pesticides; Conch meat Filthy; Lobster, Salmonella; Soursop, Poisonous; Coconut microbiology, Allergen; sulphur dioxide in vegetables; canned food, low acid canned; Coumarin	Red list; Green list
Grenada	1	0	Raw Agricultural Products for Pesticides	Red list
Guyana	1	4	Fish, Filthy; Fish, Histamines; Fish, Salmonella; Shrimp, sulphur dioxide; Coumarin	Red list
Haiti	7	2	Ackee, poisonous; Raw Agricultural Products for Pesticides; Lobsters, Salmonella; Smoked fish, Clostridium, Botulinum; Breadfruit, low acid canned; Coumarin	Green List; Red list
Jamaica	4	3	Smoked mackerel Unregistered process and manufacturer; Ackee, poisonous; Raw Agricultural Products for Pesticides; Lobsters, Salmonella; Conch meat, sulphur dioxide; Unsafe Food colouring	Green list; Red list
St. Kitts and Nevis	0			
St. Lucia	0			
St. Vincent and the Grenadines	0	1	Conch meat, Salmonella	Red list
Suriname	1	3	Trout, Salmonella; not in compliance with seafood HACCAP; Vacuum-packed fresh fish potential Clostridium Botulinum; unsafe colouring	Red list
Trinidad and Tobago	8		Raw Agricultural Products for Pesticides; Frozen shrimp, sulphur dioxide; Unsafe Food colouring	Red list

Source: FDA http://www.accessdata.fda.gov/cms_ia/countrylist.html

Table 9: FDA refusals by cause and country for fisheries-related products (HS03) in 2015

Country	BS	GY	HT	JM	SR	Fish and Fish products
SALMONELLA-9	1		6			Spiny Lobster, Rock Lobster
FILTHY-249		255			5	Various seafood
Unregistered process and manufacturer				2		Mackerel, Cold Smoked
Labelling contents, nutrition, etc.		5			1	Various fish species
Total	1	260	6	2	6	

Source: <http://www.fda.gov/ForIndustry/ImportProgram/ImportRefusals/default.htm>

A ban to import into the US applies to all registered suppliers identified by the FDA import alert system, either for specific product or altogether. In reverse, bans apply to all exporters apart from those on 'green lists' when these are in force.

A green list is usually in force for operators supplying potentially poisonous products, such as ackee or soursop. For example, for ackee, which may contain a toxin (hypoglycin A) if not properly harvested and processed, FDA assesses all processors of ackee for export to the United States on an individual supplier basis. If they comply, the establishment and its products are identified on the yellow list of the import alert and subject to a satisfactory period of intensified surveillance, progress to the green list. Similarly, green listed suppliers may be downgraded pending a further field examinations following a violation.

6.6.3 Costs of rejections in international trade

The costs of non-compliance are only poorly represented by reject rates (discussed in the previous section), which often are very small. For example, an analysis of rejects in international fish trade by Megapesca in 2011³³, found that the total value of border rejections of fishery products from less developed countries to the EU, US and Australia was c. US\$70 million/year from 2002-2010, corresponding to about 0.2% of exports in to the EU, 0.4% to the US and 0.5% to Australia. However, for some countries, rejections rates could be higher (e.g. 1.8% for exports from Bangladesh to US and 1.8% for Indian exports to Australia).

As well as loss of the value of the consignment, the exporter may sustain additional costs in administration. There is no fee for FDA routine inspections. However, in case of non-compliance, FDA invoices re-inspection services for importers.

Since the Bioterrorism Act (2002) foreign facilities must designate a US agent. It can be any person who resides or maintains a place of business in the United States and is physically present in the United States. The Agent communicates with FDA on behalf of the foreign facility in both routine and emergency circumstances.

In CARIFORUM countries, the US Agent invoices the responsible party for each foreign facility for the direct hours, including travel spent to perform the re-inspection at the appropriate hourly rate (US\$325 per hour in

³³ Trade Standards Compliance in the Fisheries Sector, . Expert Consultation on Strategic Cooperation between UNIDO and European Commission, Directorate General for Health and Consumers (DG SANCO), . Accra Ghana, 8 November 2012, Steffen Kaeser, UNIDO and Ian Goulding, Megapesca

2012³⁴). The compliance program specifications are detailed by commodity groups and risk factors for domestic and imported products on the FDA website³⁵.

In Europe, revenue to finance official controls is generated via general taxation based on a user fee, which Member States have to charge³⁶ for official controls. The Regulation requires that mandatory inspection fees be collected for the documentary, identity, and physical checks to be paid by the importer or their custom's representative.

These are higher where the presence of control authority staff is most intensive (i.e. production of meat, fishery, dairy products, and certain activities performed on imported goods at the borders). The levels of the inspection fees, the methods and data used for their calculation are subject to the rules laid down in the Regulation.

When official controls reveal non-compliance with feed and food law, the business operator concerned must pay the extra costs resulting from additional controls. Fees are harmonised across member states, and are published by each designated point of entry.

However, clearly, if these losses can be avoided by better application of SPS controls, there will be an immediate gain in added value to the agri-food production sector in the country of origin.

³⁴. <http://www.fda.gov/Food/GuidanceRegulation/GuidanceDocumentsRegulatoryInformation/ucm274176.htm>

³⁵. <http://www.fda.gov/Food/ComplianceEnforcement/FoodCompliancePrograms/ucm071496.htm>

³⁶. Regulation (EC) N° 882/2004

7 BENEFITS AND COSTS OF SPS COMPLIANCE

7.1 Overview of costs and benefits

Benefits of improved SPS compliance are ultimately derived from changes in trade volumes and value, in terms of (i) increased value of exports (ii) reduced imports, (iii) increased national sales, and in more secure employment. The increased value of exports may be due to increased volume and better unit prices (or both). In addition, there are indirect benefits to be derived from improved public health (reduced health costs) better veterinary and plant health (with improved productivity and profits, and reduced investment risk for farmers).

The benefits derived from strengthened SPS conditions quantified in this study are estimated in terms of increased trade values (volume and price). These are derived from:

- Reduced rejects in international trade (current range 0.2 to 1.8% of consignments)
- Reduced transaction costs (removal of automatic detention, testing, certification requirements)
- Premium prices (removal of importer discounts)
- Extended access to markets (range of products/markets)
- Increased volume and unit value added of trade
- Reduced risk and increased investment in national production (leading to import substitution)

However, the value of strengthened SPS systems is also derived from the protection of consumers from foodborne infections, and the protection of national agriculture and ecosystems from imported invasive species and pathogens. As well as trade benefits, it also therefore facilitates the development of national value added (Figure 7). Access to high value export markets—including in-country tourism trade is therefore one of many benefits. For this study, international trade is seen as an indicator of success, but in the context of the Caribbean, agri-food production can also directly sell to tourists bringing foreign currencies.

This section sets out a more detailed analysis, which has informed the estimations of costs and benefits analysed in the remainder of the report.

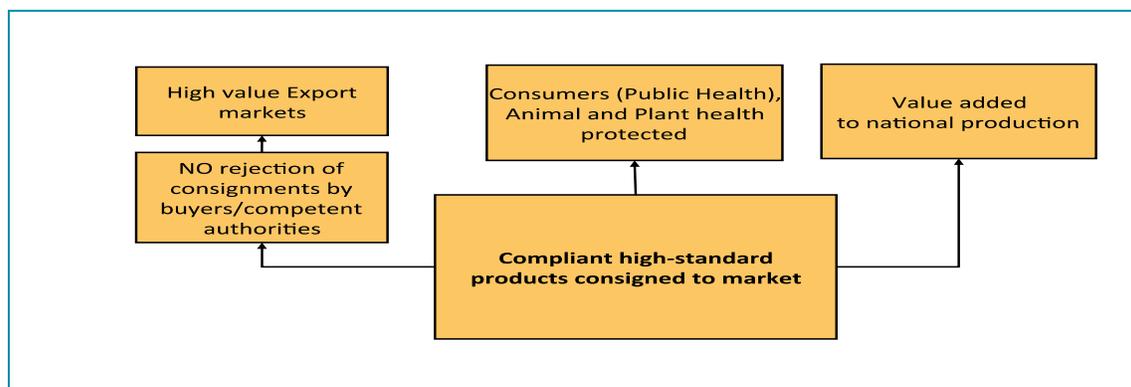


Figure 7: Benefits from SPS-compliant national agri-food production

Putting in place and keeping an SPS-compliant system is also costly. In a World Bank study SPS compliance costs are split into four categories as shown in Table 10, (Maskus 2005³⁷).

Table 10: SPS compliance cost categories

Sector	Capital investment	Operating costs
Private	<ul style="list-style-type: none"> Investment in upgrades to establishments Training of personnel Setting up new management systems (HACCP, traceability, etc.) 	<ul style="list-style-type: none"> Higher levels of management (record keeping) Operating management and control systems (HAACP) Sampling, testing and certification fees
Public	<ul style="list-style-type: none"> New public infrastructure (markets, landing sites, export facilities, etc.) Upgrading official control systems Laboratory capacity 	<ul style="list-style-type: none"> Costs of operating inspection and official controls (including laboratories)

7.2 Trade benefits of improved compliance

7.2.1 Gaining and retention of market access

One of the greatest benefits of improved SPS conditions for a country is access to international markets. As was shown, both the US and the EU now operate import SPS regimes, which effectively require pre-approval of the SPS compliance conditions before products are allowed into the market. Not all countries can access all markets, and those that suffer effective bans lose all the benefits to be derived from trade. These benefits therefore fall to those countries that can organise their official controls and agri-food export business operators to apply compliant systems and ensure that only compliant products are exported. It is also clear that once access is obtained, there is a need to maintain SPS control systems. Failure to do so can result in temporary or permanent loss of market access (EU and US bans).

However, getting and keeping access to markets does not deliver a benefit per se, since the access has to lead to trade. There have been some examples (elsewhere than the Caribbean) where countries have invested in meeting EU conditions but little or no trade has developed. For example, in 2015 Kenya met conditions for the export of aquaculture products to the EU, but the cost of production is not competitive, the local market can absorb all of the production and until now, no exports have taken place. This illustrates the need to link SPS and trade policies closely, so that investment in SPS controls not only reflects risk, but also market demand. It also suggests that there is a minimum level of trade for a given flow, below which it may not be cost effective to develop SPS control systems additional to those required for domestic policy purposes. Nevertheless, SPS compliant access to markets remains a *sine qua non* for trade in agri-food products.

³⁷ Maskus, K.E., T. Otsuki and J.S. Wilson, 2005. The Cost of Compliance with Product Standards for Firms in Developing Countries: An Econometric Study World Bank, 35p.

7.2.2 Improved value and volume of trade

Even where a business operator does not suffer a temporary or permanent loss of clients (whether in the form of generic access to a market, or individually as a result of an import alert or ban) when a sector or a country suffers from non-compliances, this is often reflected in discounted prices, in which the discount represents the risk to the importer of a loss due to a subsequent non-compliance.

The reason for the discount is that the importers can suffer a range of additional costs due to non-compliances, and the discount compensates for the risk that they may face. Importers can sustain costs due to increased administration, changes in insurance premiums, demurrage and increased fees, for example in re-testing. They may be required to undertake a sorting exercise or re-export the consignment, or to pay for it to be destroyed. Non-compliance could also require the importer to sustain a heightened level of official surveillance in the future (for example in the case of the FDA yellow lists, or the EU's safeguard measures). If the consignment has been cleared before the non-compliance is identified, then the operator will have to organise a recall and compensate the customers accordingly. Whilst many of these costs might be covered by the supplier in the exporting country (under the terms of the supply contract), there is a significant administrative burden and a risk of loss of business. Insurances may also cover the costs, but this would impact on future premiums.

As a result, importers are generally happy to pay premium prices for SPS secure supply chains, where they can purchase with confidence that none of the above are likely to occur. This is the source of the added value per unit of export to be obtained.

Similarly, supply chains that can meet these conditions see their volumes increase as trade linkages are extended. This occurs through increased volumes via existing channels, supply to new customers in existing and new markets, and new entrants on the supplier side. As a result, the net trade benefits of SPS compliance are expressed in a combination of increased volume and higher unit prices. The actual increases to be expected in the CARIFORUM region are assumed, based on published studies and the trade interviews conducted in the countries visited during the field missions. These were conservatively assumed to be in the range of 0.4 to 1% per year, in the case of prices and 0 to 2.3% in the case of volume growth, depending on the product.

It should be noted that volume increases might sometimes be limited, for example in the case of renewable resources (such as capture fishery products or forestry products) where there are natural limits to sustainable exploitation.

7.3 Public Benefits

7.3.1 Improved public health

Public health benefits of compliant SPS systems are difficult to estimate, especially in CARIFORUM countries, where people do not systematically consult a doctor in case of food poisoning (A. Vokaty PAHO/WHO pers. com.).

A recent compilation from André Gordon (2017) shows costs in excess of US\$1 billion for the year 2015 in Canada alone (Table 11). The USDA Economic Research Service mentions that 1 in 6 people will be sickened by foodborne pathogens acquired in the US. It estimates the economic burden, mostly linked to death, to be between US\$5 and US \$37 billion, corresponding to an average of US\$15.5 billion (2013 dollars) per year (USDA, 2015). There is no equivalent data in relation to the CARIFORUM region, but as noted previously, applying this

data pro rata by population, suggests that the current annual cost of food poisoning to the domestic population of CARICOM countries could be in the region of US\$1.4 billion. Reducing this cost of non-compliance would provide substantial cost saving (and therefore benefit) to the region.

Table 11: Impacts of foodborne illnesses per year in selected countries (various years 2010-2015)

Country	Population 2015 (million)	Estimated cases of illness (million)	Hospitalisations	Deaths	Estimated cost (US\$ billion)
UK	65.000	1.000	20, 000	500	2
US	323.644	48.000	128, 000	3, 000	5 to 37
Canada	362.420	4.000	11, 600	238	1.1

Source: Compilation from A. Gordon, 2017

Public health benefits of strong food safety systems are also closely linked to the development of tourism, and a higher contribution of agriculture and fisheries production to the tourism sector. High-end hotels and restaurants in the region, which cater to international tourists, are extremely aware of the reputational risk of food poisoning outbreaks. The issue is also taken extremely seriously as it increasingly comes with a threat of litigations for damages.

7.3.2 Improved veterinary and plant health

Improved SPS conditions include better protection of domestic markets, both through measures to control import of hazardous materials, and to ensure that measures are applied to limit the transmission of hazards, should they occur. This is especially evident in the animal and plant health components of SPS, where there is a need to protect domestic production systems from animal and plant diseases, to ensure that they can continue to supply their markets, both domestic and export.

Benefits to human and veterinary public health, and those pertaining to biodiversity protection from invasive species are not so easy to quantify, given that the benefits are derived from a reduction of the probability of an undesirable event (such as the introduction of new harmful agent). The costs of the introduction and spread of disease agents can be substantial. The major benefit expected from a strong SPS system is a shared understanding of the risks among inspectors, extension personnel and producers to minimise risks, allow a rapid response and reduce impacts on the productive sector.

However, there are other benefits to be noted. In Barbados, a study to identify the benefits of strengthening national SPS conditions³⁸ identified that an empowered National Plant Protection Organisation would protect against the import of plant diseases and insects, contamination, and unwanted ingredients. Prevention of entry of genetically modified organisms (GMOs), currently a non-SPS matter, was also considered to be an advantage. Seed quality would benefit from the prevention of noxious weeds and improved quality, yields, etc. Ensuring that only authorised plant protection products are imported, brings advantages of environmental protection and enhanced protection for human health (farm workers), food safety (chemical residues), the environment and biodiversity.

³⁸ Business Case for Investments to Strengthen the National Agricultural Health and Food Control System in Barbados, Food Agriculture International October 20, 2012

Regarding veterinary controls, as well as strengthened protection against the entry of animal diseases, benefits were expected in relation to the composition and purity of animal feeds, improved broodstock of food animals through better controls on import of genetic material and supporting the development of hatcheries for several animal and fish species. New veterinary drug legislation would ensure elimination of use of unauthorised substances and the reduction in the amount of drug residues in food of animal origin; with human health benefits in reducing the amount of antimicrobial drug resistance. The issue of animal welfare would also be addressed, bringing more humane conditions to the production, transport, and slaughter of food animals. All the benefits can be simply expressed as an improvement in productivity (in terms of value added) to the farm sector.

In Barbados, the cost of building the SPS control system (including food safety) to deliver these benefits was estimated to be US\$92million over 10 years. After this period, it was estimated that the annual net benefits in reduced productivity losses due to all of the above factors would be in the region of US\$9.4 million/year (two-thirds from animal health and one third from plant health improvements). Overall, including food safety, the incremental net benefit projected for Year 8 was US\$8 million, rising to US\$11.6 million by Year 10 and to US\$18.3 million annually by Year 2032.

Similarly, an IICA-supported regional investment project to eliminate the Carambola Fruit Fly in Brazil, Guyana, and Suriname³⁹, estimated that a failure to prevent the spread of this pest would impact significantly on the export fruit sector, in particular mango. Estimated losses in fruit-producing regions of Brazil, Venezuela, Colombia, and the Caribbean would be in the region of US\$100 million.

A recent example (in 2013) of an effort to obtain the benefits of SPS measures is the steps taken by the Dominican Republic to prevent the transmission to the region (from SE Asia) of a disease of farmed shrimp, known as Early Mortality Syndrome (EMS) or Acute Hepatopancreatic Necrosis Syndrome (AHPNS). The introduction of this disease into the Dominican Republic would put shrimp farms in the country at risk, given the associated high morbidity and mortality, justifying the lawful measures (notified to WTO⁴⁰) to suspend imports of live and dead shrimps.

Avian influenza is a threat to those CARIFORUM countries that have developed a poultry industry, which is an important activity in the region. All countries have national egg production (21,500 tonnes in 2012), and the Dominican Republic, Jamaica, and Trinidad and Tobago are major broiler chicken meat producers, (contributing 90% of the regional production of 808,000 tonnes in 2012), many other CARIFORUM members are also engaged. Overall the sector is estimated to contribute between 10% and 65% of agricultural GDP, with direct employment in the industry estimated at 61,900 and indirect employment a further 33,500, emphasising the strategic importance of SPS measures to the food security and employment in the region⁴¹. However, the level of imports of this commodity remains high (210,000 tonnes in 2012, accounting for at least 20% of the market on average). The risk of introduction of poultry diseases remains one of the outstanding regional animal health threats, and maintaining the current avian influenza free status by reducing the risk of introduction of infective material is likely to be a significant benefit of strengthened SPS measures.

³⁹. Competitive Fund for Technical Cooperation, Final Report, Period: 07-01-2011 to 07-31-2013, PROJECT: Carambola Fruit Fly Control and Eradication Supporting Project, Prepared by Alies van Sauers-Muller, Inter-American Institute for Cooperation in Agriculture, 2013.

⁴⁰Notification of Emergency measures, WTO Committee on Sanitary and Phytosanitary Measures, G/SPS/N/DOM/50, 8 August 2013 (13-4219)

⁴¹. Caribbean Poultry Association; <http://www.caribbeanpoultry.org>

Apart from the one instance found in a fighting cock from the Dominican Republic, only Belize has had an outbreak of avian influenza, of the low pathogenicity kind (LPAI). With a strong SPS system and close collaboration with the industry, Belize managed to stamp out the outbreak in a few months. The virus strain at the origin of the infection was identified to have originated from Mexico, which has regular outbreaks, as does the US. The rapid response from the Belizean Competent Authority, extension services, and the farmers organised into producer organisations, resulted in relatively small costs, estimated at US\$3 million for an industry with a US\$110 million wholesale value. By comparison, a recent outbreak of a highly pathogenic strain of avian influenza in duck farms in the south west of France carried similar depopulation costs, but losses to farmers were estimated at US\$13 million with an additional US\$4 million along the value chain (Table 12).

Table 12: Examples of main SPS risks and associated costs

SPS Risk	Examples	Costs (US\$ '000)
Avian Influenza LPAI	Belize, 2014-15 LPAI outbreak (US\$110 million wholesale value; BAHA-BPA presentation, CAP symposium, Oct. 2015)	US\$3 million (US\$1.6 m depopulation)
HPAI	France, 2016 HPAI outbreak SW duck farms (\$US 120 million; CIFOG, 2016)	US\$1.2 million depopulation; US\$13 million farmers lost production and US\$4 million up and downstream

Source: own compilation

7.4 Public Sector Costs of SPS compliance

Costs of compliance may be classified as either capital (investment) or operating costs.

7.4.1 Investment costs

Public sector investments are associated both with the development and application of SPS measures, i.e. regulatory control systems and associated requirements, as well as any public investments in infrastructure that might be required to ensure compliance.

In terms of the regulatory system, there are costs to government associated with the preparation and promulgation of legislation, but these are often relatively minor. However, the large number of CARIFORUM countries that do not have the required essential SPS legislation suggests that political will is needed. Experience has shown that the costs of institutional strengthening required to implement legislation are more substantial. This is especially the case where there is a need to re-organise legacy ministerial structures such as those inherited from the colonial era. One example is where food safety may be one of several functions of a public health unit within a Ministry of Health (in which preventive health is often a lower priority than other policy areas).

Here, there is a need to invest in staff recruitment, and training to ensure that the resulting institutions and their technical orientation on SPS are fit for the purpose. Ensuring that there are effective institutional linkages between animal health, food safety and plant health functions (where these are addressed in separate institutions) and clarification of the approaches towards SPS and other quality-related regulations (TBT measures) is time consuming and costly. SPS management also needs to be supported with professional risk management capacity, to ensure that SPS resources are allocated efficiently. These meta-SPS requirements can include the

development of computerised data systems, participation in international fora, and commissioned research to support risk assessment, such as food consumption surveys. Even where certain functions may be outsourced, such as inspection bodies or laboratory testing (see below), there will be a need to develop the capacity for management of the outsourcing.

Another element of public investment often cited is in regard to testing laboratories. The services of laboratories are essential to the correct operation of animal health, plant health diagnostics, or testing for food safety, as a support to official controls, monitoring and risk assessment and, in some cases, certification of SPS conditions. Strictly speaking it is not essential for every government to invest in testing laboratories to support SPS controls since these services can, subject to certain conditions be outsourced to regional or private sector laboratories. In such cases, the investment costs may be externalised, but the SPS authority sustains a relatively higher operating cost. Nevertheless, many governments (and their supporting donors in the region) have decided over time that they should undertake direct investment in laboratories. Here the investments are not just the obvious (construction, testing equipment) but soft investments such as recruitment and training of suitably qualified staff, and development of laboratory quality management systems (accreditation to international standards such as ISO17025), which are required to ensure a good level of confidence in the results produced.

Laboratory investments represent a significant part of the overall public investment required for strengthened SPS systems. In Barbados, according to a report by Food and Agriculture International Development (2012), the cost of construction and operation of a Science Centre to provide the SPS testing and technical services accounted for 62% of the estimated public sector expenditure of US\$92million required over a 10-year period.

Another important item of infrastructure costs are the facilities required for border inspection at ports of entry and exits of SPS-sensitive products. Facilities are required for secure storage of detained consignments pending decisions. These can give rise to a need for specific facilities such as live animal lairage, quarantine facilities for animals (including fish) and plants, and facilities for inspection of consignments of food (which require unpacking containers into temperature controlled storage). The design and construction of SPS border inspection facilities of appropriate dimensions represents another major investment cost, which may or may not be integrated within investments in other border control functions such as customs, immigration, security, etc.

As well as control system investments, governments may choose to provide sectoral support to help farmers and agri-food business operators to comply with the regulatory requirements. These are not essential SPS investments, since it is business operators who ultimately remain responsible for compliance, but it is a practical recognition that without government support, compliance may not be possible. This is especially the case in regions where there are numerous small-scale producers, as in the agricultural and fishery sectors of the CARIFORUM countries. In these categories are measures such as the strengthening of extension services to help SME operators implement HACCP and traceability. Government (and their supporting donors) may also choose to invest in public and community-managed infrastructure (markets, landing sites, chilled storage facilities) with improved and compliant conditions.

7.4.2 Operational costs

Operational costs represent the on-going costs of operating the SPS infrastructure described in the previous section. They are incurred periodically and need to be considered in SPS budgetary planning.

At a basic level for the public sector, they include the costs of operating inspection services and official controls, which primarily are costs associated with staffing, and the implementation of inspections. This includes costs

of connecting inspectors to the central information system and results of risks analyses, and providing them with transport and resources to inspect and take samples. This applies to the domestic market as well as the operation of the border inspection posts for import and export controls.

Operating costs of laboratories also need to be covered by the SPS system. The costs include staffing, maintaining the equipment (repairs and servicing), maintaining the quality system (calibration of instruments, periodic audit and accreditation fees, and participation in proficiency testing). It is clear that most of these are, in fact, fixed costs (not dependent on the volume of tests, where the cost of reagents is the only important variable cost). As a result, laboratory cost effectiveness is highly sensitive to the volume of activity, highlighting the need for ensuring that: a) their capacities are appropriate to the demand (the business case); and b) that there is a clear source of income to maintain operations.

Some competent authorities require the cost of laboratory testing of a sample to be paid by the business operator who provides the sample. This may be undertaken on a test-by-test basis (undesirable since it raises the possibility of financial interests driving the testing programme) or through the application of annual approval or licence fees. Either way it defrays some of the costs of control to the private sector.

7.4.3 Employment costs and benefits

Trade benefits from SPS-compliant systems may be difficult to estimate from trade statistics, but when all scales of trade—international, regional, and national trade—are taken into account, the existence of benefits is undeniable.

By contrast, strengthened SPS standards do not always create employment. Improved SPS standards are generally easier to achieve for the larger producers, who have access to more information, have more in-house technical capacity, and more financial resources to anticipate. As processors and traders/exporters grow their businesses in size, they often do so by intensifying operations, and often by integrating all stages of the process. Therefore, increased production at high SPS standards may increase employment, but not proportionally, and may decrease opportunities for small producers. This was mentioned during interviews by processors, who may substitute sourcing from imports with stronger traceability systems, to the detriment of local small producers.

Small-scale producers have much smaller human and working capital and cash flows to mobilise at farm or fishing-vessel level. Unless small producers have strong collective organisations and support, they will not be able to comply, and the impact of the effective application of new SPS measures will be to exclude them the supply chain (since they will be in breach of the law and subject to penalties). The options of business operators are explored in more detail in the next section.

Uncoordinated application of SPS measures can therefore have a negative impact on employment and livelihoods, and the design of the measures, their introduction and accompanying support measures for affected operators, must be carefully considered.

7.5 Private Sector

7.5.1 Compliance strategies

Considering producers as a whole, a World Bank study (2005⁴²) grouped potential responses to new SPS measures into three strategies, each of which may be pursued reactively or proactively (Table 13). The approach provides a simple analytical framework for consideration of compliance approaches applied by the private sector.

Table 13: Producer-level responses to new SPS standards

Strategy	Reactive	Proactive	Cost benefit Indicators
Exit	Wait for standards and give up	Anticipate standards and leave particular markets	Industry structure, Trade statistics, interviews
Compliance	Wait for standards and then comply	Anticipate standards and comply ahead of time	Trade statistics
Voice	Complain when standards are applied	Participate in standard creation or negotiate before standards are applied	Reports

Source: Adapted from World Bank (2005) *ibid*.

The **Exit Strategy** consists of leaving the market that is imposing new SPS standards for a less costly alternative. It is evident in CARIFORUM countries, especially for high SPS-risk commodities such as poultry meat and fish. Products previously exported are now only consumed locally or exported to less demanding markets, due to the difficulty and cost of meeting EU or US requirements. If the new standards requirements correspond to improved SPS measures, as opposed to disguised barriers to trade, then the exit strategy results in a net loss for all involved. In particular, the double-standard system that still exists in some countries, with one standard for exports and another for local markets, does not make economic sense in the Caribbean where tourism is such an important market.

The **Compliance Strategy** aims at meeting SPS standards conditions. It is the strategy assessed in this analysis. **Jamaica, for example, is currently undertaking the development of national SPS standards that are fully compliant with WTO SPS standards.** Costs and benefits are estimated for the private sector, in terms of investments and operational costs of upgrading and maintaining compliant systems, and can be evaluated with a benefit-cost ratio (BCR - expressed as the additional value added per unit of investment in the upgrade).

Finally, the importance of representation and active participation in WTO, regional, and national meetings need to be emphasised (the **Voice strategy**). Caribbean-specific problems need to be presented and taken into account while setting standards at the international level (OIE, IPPC, Codex) and national and CARIFORUM opinions need to be heard.

7.5.2 Value Chains

Complying with SPS standards poses specific challenges to private sector operators at different stages of the value chain. A typical value chain for agricultural and fisheries products would have several points where SPS

⁴² WB, 2005. Food Safety and Agricultural Health Standards: Challenges and Opportunities for Developing Country Exports, Report No. 31207

controls can impact business operators at different levels (Figure 8). It is important to recognise that in terms of export, compliance with SPS conditions of the market is an entirely voluntary measure, in the sense that a country and/or its exporters have free will to make a strategic decision whether to supply a particular market or not. This gives rise to possible strategic options, as set out in Table 13 above.

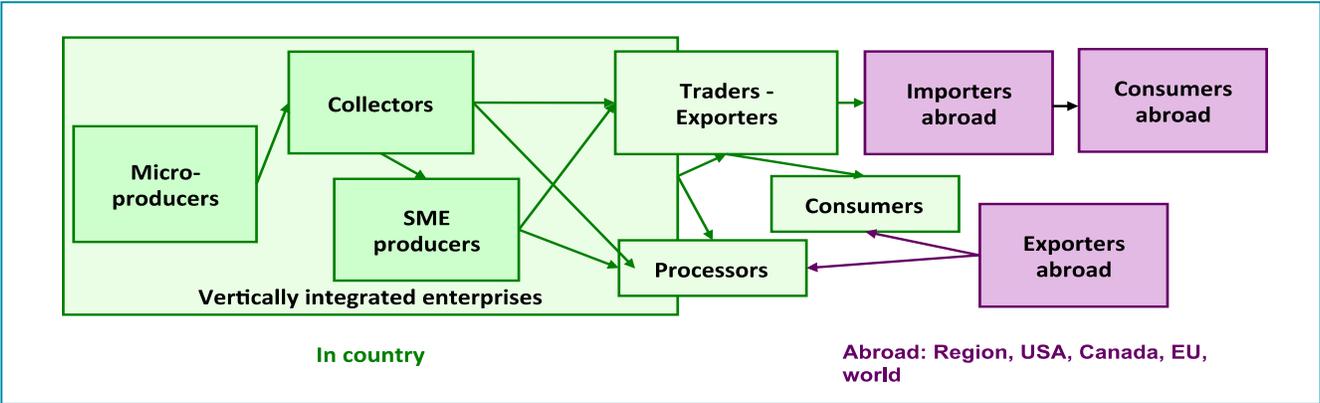


Figure 8: Value chain components for the CB analysis

Micro-producers often face disproportionate implementation costs and, if the value chain involves a number of intermediate processors and traders, they may derive relatively little benefit from complying with SPS requirements. While it is an indicator of social importance, a large number of micro-producers (as is often the case in CARIFORUM countries) may therefore be seen as an SPS risk factor. Governments may develop specific strategies to support micro, small and medium enterprises through agricultural extension services, decentralised testing laboratories reinforced by regulatory obligations, and support to increase the capacity and capabilities of producer organisations.

Other solutions that emerge from the private sector range from control of all production stages through vertical integration (e.g. poultry farms) to increased capacity of small-scale producers through collective action to improve producer capability (e.g. fruit production in Belize).

Some costs and benefits of good SPS infrastructure may also be borne by importing countries through technical assistance programmes and by importers outside the country and CARIFORUM region. However, the burden of compliance and associated costs lies with the commodity-exporting countries.

With regard to the private sector, an OECD (2007) study⁴³ reviewed a number of SPS investment projects and noted that both fixed and variable compliance costs influence a producer’s decision about whether or not to export to a particular market. Differences in production structure mean that some firms can more easily comply with standards than others. They can also exploit economies of scale in standards compliance, expanding their exports over time, even after the introduction of stricter regulation, and thereby decrease the trade impact of standards on their trade in agri-food products over time.

There is a distinct line between technical barriers to trade (TBT) and SPS standards in many cases (Section 3.1), although key basic requirements, such for traceability and labelling, need to be put in place for both. Increasingly, TBT regulation standards and voluntary measures (such as ‘Organic’ and ‘Fair Trade’ embraced by Jamaica for its Banana Export Expansion Programme [BEEP]⁴⁴, Good Agricultural Practice [GAP], or Marine Stewardship Council

⁴³. See Section 2.2.3

⁴⁴. Minister of Agriculture, Labour and Social Security, Ministry Paper 73/2015 Banana Export Expansion Programme

[MSC] standard for sustainably managed fisheries⁴⁵), are implemented by many private sector producers in the region. The development of Caribbean region- and country-specific standards also makes them easier to take up for small producers who target tourists. Increasingly, many countries in the region, through linkages between agriculture, tourism and trade are supporting improved SPS and TBT.

7.5.3 Investment costs

The private sector costs of enhanced SPS systems are associated with the need to respond to the strengthened regulatory environment. Small-scale operators, both producers and traders, are therefore extremely sensitive to the application of new regulations, both in terms of the requirement for increased capital investment, as well as the impact on operating costs. However, it is worth noting that the two kinds of costs are not entirely independent. As well as investment incurring routine interest payments or other finance related costs such as depreciation, there is often an associated additional cost. For example, modern equipment may require higher levels of service and maintenance; and better skilled and higher paid operators. A World Bank Study on Moroccan export compliance⁴⁶ assessed costs for small businesses to determine the effect of applying enhanced SPS standards on the cost of production. The finding was that a 1 per cent increase in investment to meet compliance costs in importing countries raises variable production costs by between 0.06 and 0.13 per cent, a statistically significant increase.

Animal and plant health regulations require farmers to adjust their production methods, for example in terms of the ways in which agricultural chemicals (pesticides and veterinary medicines) are used. This may require equipment upgrades, investment in better record keeping, and secure farm storage facilities, as well as the operator training required for implementation.

Operators along the supply chain may also be required to improve hygiene conditions in production and processing facilities, requiring upgrades in buildings, equipment, and other facilities. Food safety requirements for chilled storage (for example milk chillers on farms and use of ice on fishing boats) all require capital investment. There may be additional costs associated with meeting specific export conditions, such as hiring or training of personnel (e.g. in better food hygiene conditions), registration with the FDA, and development of management systems required by regulation, such as HACCP and traceability. For these, initial investments may be high, and upgrades will often be required periodically, in addition to higher operational costs for audits and checks on an annual basis.

7.5.4 Operating costs

As noted, the implementation of SPS measures requires farmers to engage in measures to protect animal health and plant health. Thus, there is often a requirement for them to apply eradication or control measures (crop protection, vaccinations, movement restrictions, etc.). Improvements in SPS conditions also have an impact on farmers when there is an outbreak, in terms of restricted movements of plant or animal materials or, in extreme cases, destruction of the affected stock. Here whilst there is a specific additional cost to the affected producer, there is a net benefit to the sector, which in some countries may receive public sector support. In such cases, the cost falls to the public purse in terms of compensation schemes. As well as adjusting the regime, the need for

⁴⁵ For Suriname Seabob shrimp, see msc.org

⁴⁶ The Cost of Compliance with Product Standards for Firms in Developing Countries: An Econometric Study; Keith E. Maskus, Tsunehiro Otsuki, and John S. Wilson, World Bank

better management (operator safety, record keeping, observance of withdrawal periods) may also be required; all of which incur additional costs for the operators.

Along the supply chain, ensuring compliance with SPS measures may well require operators themselves to engage in higher levels of sampling and testing to be able to prove compliance. For example, ensuring safety of water supply, checking that cleaning and sanitising procedures are effective, medical monitoring of employees, all incur additional routine costs, and are often required in modern food hygiene regulations.

As well as investment in setting up the HACCP systems, such systems then need to be implemented, and most often require additional qualified staff. For example, the FDA mandatory seafood HACCP regulation, 21CFR Part 123.10, requires specific HACCP activities to be completed by a “HACCP trained individual”. Training must be through an FDA-accredited course providing a “standardized curriculum” which can take up to 3 days⁴⁷ and cost between US\$500 and \$1000 per person.

⁴⁷ See Seafood HACCP Alliance <http://seafoodhaccp.cornell.edu/Intro/08.html> and <http://www.fda.gov/food/guidanceregulation/guidancedocumentsregulatoryinformation/seafood/ucm2018426.htm>

8 CASE STUDIES: COST BENEFIT ANALYSIS

The general approach to the analysis of costs and benefits was described in Section 2, and the categories of benefits and costs, public and private, were reviewed in Section 7. This section describes in a quantitative manner, the case studies developed under the project, and the assessment of the costs and benefits associated with each.

8.1 Selection of case studies

Case studies were selected to correspond to a specific set of challenges for CARIFORUM countries. The main selection criteria were:

- Importance of the commodity group in the country's trade;
- Commodity-specific SPS challenges and SPS compliance systems; and
- Availability of production, costs, benefits, and trade data.

On this basis, the study used the following three commodity groups as case studies:

- Fisheries products (HS 03 - based on exports of fishery products from Suriname);
- Fresh and prepared fruit and vegetables (HS07, 08 and 20, 21 - based on exports of ackee from Jamaica); and
- Poultry (HS 0207 - based on regional trade).

The case studies were selected and analysed to represent three larger commodity groups: (i) fisheries, and aquaculture; (ii) fresh and processed fruit and vegetables, including coffee, spices, nuts; and for poultry (iii) meat products and by-products, fresh and processed. The results of the case studies are extrapolated to the remainder of their group in Section 9.

The commodity groupings for the case studies have been devised to illustrate the diversity of costs, benefits, and trade importance of strengthened SPS systems, and to help with the regional and national extrapolations. The groupings also make up for the fact that not all commodity groups could be analysed in detail, but were chosen to be illustrative enough to allow extrapolation at regional and national levels.

In 2014, the three commodity groups made up a significant proportion of the trade in agricultural and food products for CARIFORUM countries, specifically 59% of export and 62% of import value in 2014. They are grouped as 'SPS-sensitive' commodities, in comparison to 'Others' which include cereals, fresh and processed (HS 10 and 19); sugars and confectionery (HS 17); and beverages, spirits, and vinegar. 'Live' animals and plants are also considered separately, although their trade values are very low (Table 14).

Table 14: CARIFORUM Trade in agri-food commodity groups in 2014

Commodity groups 2014	Export US\$ million	% of exports Commodity group	Import US\$ million	% of imports Commodity group
Fishery products	319	9%	293	4%
All Fresh and processed fruit and vegetables	1,540	45%	2,100	28%
Others: Beverage, Cereals and Sugars	1,390	41%	2,812	38%
Meat products	156	5%	2,196	29%
Others: Live animals and plants	23	1%	52	1%
Total Exports	3,428		7,453	

In the SPS-sensitive group, fresh and processed fruit and vegetables generated the highest export value with US\$1.54 billion for all CARIFORUM countries in 2014 (45% of export value), followed by fishery products (9%) and meat products (8%). However, given the small productive capacity of many countries, agri-food imports are large, at more than twice the value of exports. Fishery products are the only commodity group that generate a net foreign export earning, of US\$26 million in 2014 (Table 14).

8.2 SPS compliance scenarios

Two scenarios are analysed, from the government services and the private sector points of view:

- Scenario 1 is the non- or partial compliance 'do nothing' scenario (representing the current situation)
- Scenario 2 is the compliant 'SPS+' scenario, with investment in upgraded public sector control systems and private sector compliance

The 'do nothing' non-compliant scenario comes with a variety of risks, with documented costs specific to each SPS components, (human health, plant, and veterinary public health). These are reviewed in sections 6 and 7. A non-compliant SPS system carries large opportunity costs to the private sector in lost value added.

For the CBA, it is assumed that the costs to trade (current baseline) of non-compliance are the same as the benefits of improved compliance (SPS+) i.e. costs are limited to opportunity costs. In the model, the 'SPS+' scenario brings sustainable benefits in trade; through increased unit value-added and increased volume.

To estimate the benefits and costs of enhanced SPS compliance (hereafter referred to as SPS+), the investment scenario assumes that CARIFORUM countries will each develop an effective system that covers animal and plant health and food safety. The 'SPS+' scenario carries investments, upgrade and operations costs, some general and some specific to the commodity group and the structure of its value chain, some for the public sector and some for the private sector. The trade benefits and costs are estimated for each case study according to the framework set out in Table 10 and Sections 7.4 and 7.5.

8.3 Fisheries products

Fisheries products (HS 03) represent one of the highest value single group of commodities exported from the CARIFORUM region, with export values of US\$319 million in 2014, slightly higher than imports (see Table 3 in Section 4).

8.3.1 Fisheries and Aquaculture production and trade

The Caribbean Regional Fisheries Mechanism (CRFM) is the regional fisheries body, which “aims 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 region⁴⁸”. As such, CRFM is not directly involved in the management of SPS issues, but its Council brings together the region’s Fisheries Ministers⁴⁹, who have a strong interest in the impacts of SPS measures on the sector. The CRFM was established by CARICOM, and the Environment and Natural Resources Ministry of the Dominican Republic is a partner⁵⁰.

The most recent data published by CRFM show that the total production from wild fisheries in CARICOM countries has been relatively stable around 150,000 to 170,000 tonnes per year, with a total of 171,000 tonnes in 2012 including the Dominican Republic (Table 15, CRFM 2014). The information is for marine fisheries and aquaculture, and production figures correspond to the quantities landed in the region. There is a large disparity between countries. Dominica and Saint Vincent and the Grenadines produce less than 1,000 metric tonnes while Guyana produces around 50,000 tonnes per year.

Table 15: CARIFORUM annual fisheries production (tonnes)

Countries	2006	2007	2008	2009	2010	2011	2012
Antigua and Barbuda	3,092	3,092	3,521	2,490	2,293	3,192	5,696
Bahamas, The	16,184	10,809	14,704	13,731	16,190	15,164	16,557
Barbados	1,974	2,391	3,220	3,467	3,229	1,773	1,300
Belize	4,817	4,195	4,205	4,922	4,529	4,930	5,835
Dominica	762	824	732	686	560	665	561
Dominican Republic							10,768
Grenada	2,178	2,393	2,407	2,387	2,458	2,451	2,445
Guyana	44,559	42,615	41,366	42,056	46,040	44,364	53,093
Haiti	11,950	11,950	17,950	17,950	17,950	17,800	17,800
Jamaica	17,293	15,998	12,625	15,805	15,174	17,507	14,518
St. Kitts and Nevis*	1,222	1,154	1,171	1,213	1,093	1,155	1,155
St. Lucia	1,668	1,776	2,069	2,078	1,983	1,946	2,116
St. Vincent and the G.	770	982	636	971	819	848	746
Suriname*	30,384	29,013	23,449	25,575	33,842	36,225	36,225
Trinidad and Tobago	13,249	13,204	13,830	13,845	13,942	13,291	12,839
Total							170,886

Source: CRFM 2014, Statistics 2012 for CARICOM members and Dominican Republic national statistics; *information missing, 2012=2011

⁴⁸. <http://www.fao.org/fishery/rfb/crfm/en>

⁴⁹. <http://www.crfm.int>

⁵⁰. Ministerio de Medio Ambiente y Recursos Naturales <http://ambiente.gob.do>

The fisheries and aquaculture sector is made up mostly of small-scale producers with nearly 4,000 vessels, and more than 100 aquaculture farms recorded by CRFM in CARICOM countries. Three countries have larger freezer vessels (Belize, Grenada, and Jamaica) authorised to export to the EU. It should be noted that these are amongst several countries in the region that register foreign-owned fishing vessels⁵¹, which fish mostly in other parts of the world and do not land their catches in the country of registration. These flags of convenience concern Belize, Saint Kitts and Nevis, and St Vincent and the Grenadines. For these countries, the fisheries tonnage reported by the World Bank (blue bars) exceed the CRFM statistics (triangles) by several orders of magnitude (Figure 9).

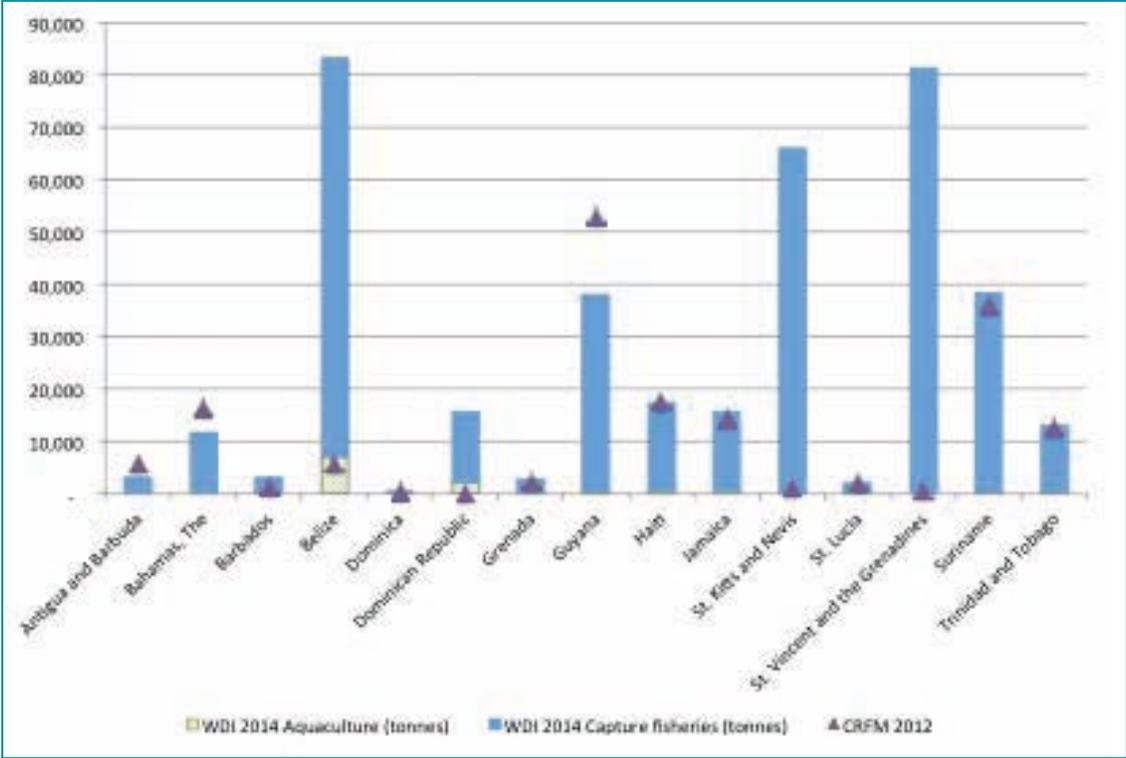


Figure 9: Fisheries and aquaculture production (tonnes, World Bank WDI and CRFM)

Captures made by foreign vessels bring foreign currency earnings through licensing and related services. Strictly speaking, their landings outside the region should be considered as exports, but the extent to which they are reported as such to the UN Comtrade database varies (which is used as the data source for this study). They are therefore excluded from further analyses.

For SPS purposes, compliance for fisheries products is the responsibility of the country where the vessel is registered (the flag state). Therefore, there must be some arrangements for the competent authority of these CARIFORUM countries with which the vessels (fishing vessels, reefers) are registered, to undertake its responsibilities as necessary. To our knowledge, this hasn't been challenged to date, but the responsibilities of the Competent Authorities in charge of Fisheries Management, with regards to catch certification and possible Illegal, Unreported, and Undeclared (IUU) catches are also engaged and have been challenged by DG MARE

⁵¹ Belize, Dominica, Jamaica, Saint Vincent and the Grenadines <http://www.flagsofconvenience.com> and also Saint Kitts and Nevis (2015) IUU NPOA

of the European Commission repeatedly. Therefore, the matter of flags of convenience, and of IUU concerns in national fisheries catch certification are strongly linked with the SPS requirement and traceability. In the region, Belize, Saint Kitts and Nevis, Saint Vincent and the Grenadines, and Trinidad and Tobago have been given a 'Yellow card' by the European Commission in the past. Belize was 'red carded' by the EU in March 2014 until December 2014, during which period exports of fishery products to the EU were banned. There are therefore trade risks associated with these registration activities which, although not directly concerning SPS issues, are closely related. In other parts of the world, countries that hold Fishing Registers of convenience such as Comoros in the Indian Ocean and Vanuatu in the Western Pacific have been similarly sanctioned⁵².

The five largest CARIFORUM exporters in value were Guyana (21%), The Bahamas (20%), Trinidad (19%), Belize (16%) and Suriname (10%). There is a wide difference between countries in the unit value of exports, due to a mix of product with very different prices inside the category HS03, in particular lobsters (HS0306) and fresh fish (HS0302) can be at least three times more expensive than cheaper frozen fish (HS0303).

Table 16: CARIFORUM countries export of fish products (HS 03 USD\$ thousand)

Country	2011	2012	2013	2014	% CARIFORUM
Antigua and Barbuda	900	1,010	627	313	0%
Bahamas, The	75,273	82,212	91,677	69,706	20%
Barbados	362	508	325	315	0%
Belize	25,406	29,010	56,497	57,298	16%
Dominica	0	0	0	42	0%
Dominican Republic	14,658	9,883	12,075	13,614	4%
Grenada	6,177	6,186	7,324	7,725	2%
Guyana	53,604	76,463	89,426	73,291	21%
Haiti	11,184	8,801	11,117	14,591	4%
Jamaica	9,508	10,195	12,490	13,861	4%
Saint Kitts and Nevis	688	1,977	124	123	0%
Saint Lucia				23	0%
Saint Vincent and the Grenadines	255	267	424	901	0%
Suriname*	33,473	34,837	36,200	36,053	10%
Trinidad and Tobago	50,761	41,560	42,710	66,625	19%
Total	267,591	293,026	348,941	340,867	

Source: ITC TradeMap, *: some information missing for Suriname HS 03

In value, the US is the largest export market by far (accounting for approximately 50%), in particular for lobsters, shrimp and high value fish. Export values are dominated by category HS 0306 (crustaceans), which include live, chilled, and frozen lobsters exported mostly from The Bahamas and shrimp (several species) exported from Belize, Guyana and Suriname. Some countries, including Barbados, St. Vincent and the Grenadines, and Dominica report trade in tuna, marlin and dolphinfish with the US.

⁵² https://ec.europa.eu/fisheries/sites/fisheries/files/illegal-fishing-overview-of-existing-procedures-third-countries_en.pdf

About 10% of the exports are destined for intra-regional trade, according to data from ITC Trademap, but this figure does not consider trade to the French Caribbean, which are accounted for in the exports to the EU.

8.3.2 SPS Concerns

The diversity of fish products and risks between and within countries is not apparent at the level of HS code used for trade figures. Numerous species and product presentations are included in the commodity group HS 03, from live ornamental fish for the aquarium trade included in HS 0301 to the traditional imported salt fish in HS 0305. In terms of exports, the most valuable products after lobsters and shrimp are fish - fresh (HS 0302), frozen (HS 0303) or as fillets (HS 0304) and conch (HS 0307). Together, they represent a wide range of SPS hazards and control challenges.

US market

The main challenge for seafood producers in the coming years is the implementation of the US Food Safety Modernisation Act (FSMA see Section 6.5.1). The FSMA introduces the Food Safety Plan, which is more than just the 'Seafood HACCP' plan. It includes all Good Manufacturing Practices (GMPs), prerequisites, recall plans, and non-compliance corrective action programs together in one outline. With the Food Safety Plan, process controls (supply chain, allergen, sanitation, etc.) are required to be preventive and expressed within the prerequisite programs, or be elevated to a CCP (Critical Control Point) within HACCP.

The first FSMA deadline was in September 2016 for large companies (500 or more full-time equivalent employees) to comply with the preventive controls rules for human food, which did not concern any fishing or fish processing in the region. CARIFORUM exporters are all small businesses (fewer than 500 employees) and have until September 2017 to comply. Very small businesses (less than US\$1 million in average annual sales) are granted a further derogation until September 2018. Therefore, within two years, the FSMA application will impose additional requirements on fishing and aquaculture business operators, in terms of hygiene and hazard controls, and traceability, to all seafood supply chains in the region. The necessary expenses, to keep exports to the US at current levels, are considered in the CBA.

EU market

Only seven of the 15 CARIFORUM countries are currently authorised to export to the EU market (Table 17). Inspection reports from the Food Veterinary Office of the European Commission illustrate specific points of SPS concern.

Barbados, for example, lost its authorisation after an EU inspection in 2009, which identified a lack of hygienic checks on fishing vessels and weak implementation of HACCP systems as major problems. At present, Barbados still cannot export to the EU. Fishers and traders have developed several labelling schemes to ensure traceability and several training modules have been delivered through the EU-IICA-CRFM-SPS project. The CRFM study on Linking Fisheries to Tourism-Related Markets (CRFM 2016) finds that significant progress has been achieved, especially with fish processing, but that standard operating procedures are still needed for the fish landing sites, and that the required legislation is still missing.

Belize, Suriname, Guyana and Jamaica export marine fish, conch, shrimp, lobster, and farmed tilapia to the EU. The companies authorised to export have HACCP programmes in place and many have been visited by the EU. Laboratory facilities for the analysis of fish products exported to the EU exist with the Fisheries Department (VKI) in Suriname, the Chemistry Food and Drug in Guyana and the Central Investigation Laboratory (CIL) in Belize.

The Organisation of Eastern Caribbean States (OECS) countries of Grenada, Dominica, and St. Vincent and the Grenadines previously traded fish products with Martinique and Guadeloupe but since the implementation of EU regulations with respect to third countries, this trade has stopped. Trinidad can no longer export fish to the EU.

Table 17: Countries authorised to export fisheries products to EU

Country	Competent Authority Food safety	Fishery products	Live Bivalves & Molluscs	Aquac.
Antigua and Barbuda	Fisheries Division, Ministry of Agriculture, Lands and Fisheries	Live lobsters only		
Bahamas, The	Department of Marine Resources (DMR) under the Ministry of Agriculture and Marine Resources	Authorised		
Barbados	N/A			
Belize	Belize Agricultural Health Authority (BAHA) under the Ministry of Agriculture and Fisheries	Authorised		Authorised
Dominica	N/A			
Dominican Republic	Consejo Dominicano de Pesca y Acuicultura, CODOPESCA			
Grenada	Environmental Health Department, Ministry of Health	Authorised		
Guyana	Veterinary Public Health (VPH) Ministry of Health	Authorised		
Haiti	N/A			
Jamaica	Veterinary Service Division (VSD) Ministry of Agriculture & Fisheries	Authorised	Marine gastropods only	Authorised
Saint Kitts and Nevis	N/A			
Saint Lucia	N/A			
Saint Vincent and Grenadines	Fisheries Division Ministry of Agriculture, Rural Transformation, Forestry, Fisheries and Industry			
Suriname	Vis Keurings Instituut (VKI), under the Ministry of Agriculture, Animal Husbandry and Fisheries	Authorised		Authorised
Trinidad and Tobago	N/A			

Source: own compilation

The EU-export ban suffered by Belize for most of 2014 provides an illustration of the potential losses incurred. Belizean exports to EU countries decreased in 2014 by 77% from the 2013 value of US\$4.4 million, but the value exported worldwide remained stable around US\$57 million (see Table 18). In this case, given the absence of

SPS concerns and the high demand for fisheries products worldwide, it appeared that exporters could find alternative markets.

Table 18: Changes in Belize seafood (HS03) export markets following EU ban for most of 2014 (US\$ thousand)

Importers	Exported value in 2013	Exported value in 2014	Exported value in 2015*
United Kingdom	2,370	986	9,162
Spain	1,757	189	-
France	354	4	-
Germany	5	4	15
European Union	4,486	1,183	9,177
US	25,202	19,070	16,852
Mexico	12,069	26,465	10,768
World	56,497	57,298	44,536

Source: ITC TradeMap, *2015 figures still preliminary

The situation is different when bans follow serious SPS compliance issues that are not addressed on time. In December 2015, an inspection in Suriname from the European Commission Health and Food Safety Directorate General identified several non-compliance issues (method used to apply additives to shrimp, potentially contaminated seawater used on board vessels, possible microbiological contamination of ice and process water), that put the EU consumers at risk. Following the inspection's finding, VKI, the Suriname CA immediately suspended the companies concerned (vessels and processors) from exporting to the EU. The producers (fishing vessels) and processors concerned had to suspend operations, reorganise and undertake important upgrades, with costs ranging from a few thousand to hundreds of thousands of US dollars before they could start operations and regain their eligibility for EU exports. The private sector range of costs involved in this case is represented in the CBA case study.

Laboratory capacity

Some of the fisheries products carry specific SPS risks that require specialised testing. Some are species-specific (e.g. histamine, shellfish poisoning, ciguatera, heavy metals, etc.) and others come from the aquatic environment - natural or farm (environmental chemicals, aquaculture feed and drugs), while others originate from inadequate post-capture handling (bacterial toxins) and processing (food additives, colouring). A comprehensive review is given in the US FDA's Seafood HACCP Guidance⁵³.

To meet export requirements, the competent authorities and the producers and processors must have access to laboratory services that undertake the following:

- Analysis of chemical hazards fishery products
- Analysis of microbiological hazards in fishery products and hygienic monitoring of the environment in which fish is handled
- Chemical and microbiological analysis of water used in fish processing and ice-making

⁵³ <https://www.fda.gov/downloads/Food/GuidanceRegulation/UCM251970.pdf>

The same capacity is also essential to test the quality of imported fishery products, such as Tilapia and Swai (*Pangasius* - catfish) fish products imported from Asia for environmental and aquaculture chemical and drug residues, and to test imported and exported broodstock for aquaculture diseases. It has already been noted that numerous CARIFORUM countries have made large investments in laboratory infrastructure in the past; in fisheries-specific testing laboratories. For example, via JICA, the Japanese International Cooperation Agency, although the extent to which these are financially sustainable is questionable in some cases.

8.3.3 Benefits under compliant SPS+ system

Trade benefits for fisheries and aquaculture products may be limited, due to the unique nature of capture fisheries that supply the majority of the export products. Improved SPS compliance is assumed not to imply increased production for wild fisheries, due to the limitations of sustainability of the resource base. This is not the case for aquaculture, which is developing rapidly and, because it is not so limited, provides even more justification and potential benefits for an improved SPS system. However, at present aquaculture does not feature strongly in the overall regional trade profile, and its features are not considered in the CBA.

Increased demand, due to a better penetration of export markets with improved SPS conditions, are therefore assumed to result only in an improved unit price. For wild caught fish, a strong consistent SPS system offers the prospects of higher prices, from local buyers and through direct sales. Increased prices are reported for high value markets, for example spiny lobster prices were increased by a premium of 15 to 25% when sold into higher value markets (CRFM, 2016). However, this rate of increase is unlikely to be sustainable for lower value products. Based on documents, information and interviews, the consultants have assumed a conservative 10% premium for SPS-compliant fishery products. For the base scenario, for a country exporting US\$30 million, the estimated annual increase in value added is 10%, for the life of the investment (10 years), equivalent to US\$3 million per year, or US\$30 million over ten years (see Table 19 and Annex 5 Section A5.1 detailed tables).

Table 19: Benefits of SPS+ scenario assumed for fisheries and aquaculture products

Benefits under SPS+
<p>No Increased production</p> <ul style="list-style-type: none"> ○ Zero potential growth assumed for wild fisheries ○ Strong annual growth potential for Aquaculture in some countries (not included in the CBA)
<p>Increased first sale value</p> <ul style="list-style-type: none"> ○ 10% increase in annual export value (=US\$30m) ○ Increase in exports from US\$300 million to US\$330 million

8.3.4 Costs of compliant SPS+

Public sector costs

Detailed costs for upgrading the competent authority functions and the private sector facilities, and data on trade volumes and values are based on information collected during the field mission in Suriname, where the VKI has upgraded its government offices and laboratory infrastructures recently, and where private sector operators

are upgrading facilities in response to a recent EU inspection and were willing to share quantitative information. However, the figures used in the model are hypothetical and constructed to reflect a typical CARIFORUM country exporting fishery products worth US\$30 million per year.

Costs that are deemed necessary to upgrade and run an effective competent authority are shown summarised for a 10-year period in Table 20. They include the following:

1. **Systems upgrade** costs correspond to expertise and consultancy services needed to revise legislation, to keep the database and other IT systems up to date, and for the management and technical services to gain and keep any certification they need. An initial investment of US\$90,000 is budgeted (reviewed after 5 years, with an increased annual expenditure of 15% for a total of US\$300,000 over 10 years).
2. An infrastructure construction or refurbishment investment for the **competent authority (CA)** facilities and equipment of US\$750,000 split over the first two years of the project. These may concern the central and decentralised administrative offices, inspectorate, and extension services, inland or in the major fishing ports. A 15% operating cost is added, to cover maintenance and equipment replacement, corresponding to a total US\$1.069 million over 10 years.
3. Infrastructure and equipment investment for the construction or upgrade of **laboratories and technical facilities** of US\$1 million, split over the first two years. The investment corresponds to the value of trade in the case study and the current baseline capacity in the region, but it is important to note that the necessary laboratory facilities do not have to be sited within the CA. The investment could be made with a university or a private sector laboratory service provider, for example, as part of a public-private partnership solution. It could also be shared across different commodities, or even be made within a regional laboratory. Annual operating costs of laboratory and technical facilities are taken (conservatively) to be 25% of the cumulated investment cost to cover the cost of operations, maintenance and replacement of equipment, supplies and salaries above the current baseline. This adds another US\$2.375 million to the investment costs.

Based on the initial investments (2 years) and the associated operating costs, over a 10 year period the cost of upgrading the competent authority is estimated to be US\$5.5 million over 10 years (Table 20). More details are provided in Annex 5.

Table 20: Public sector costs to upgrade and operate an SPS+ compliant competent authority for fishery and aquaculture products

	Investment Cost (US\$1,000)	Increase in annual operating costs
Systems upgrade (legislation, certification, IT)	(every 5 years) 90	15
CA facilities (offices, vehicles, equipment)	750	15%
Laboratory (facilities, equipment, accreditation)	1,000	25%
TOTAL (US\$1,000) with operating costs over 10 years	5,494	

Private sector costs

Depending on the value chain and the product—whether it is exported fresh by air or frozen on board vessels or on land, or processed into fillets or smoked, etc.—investments will be needed at different stages and locations. The number of units and sizes of individual facilities will vary between countries and does not change the CBA model.

Investments from the private sector to meet modern hygiene standards, seafood HACCP plans and FSMA Food Safety Plans that are included in the model are as follows:

1. Upgrade of processing factories (grading, freezing), US\$250,000 in the first year;
2. Upgrade of fisheries or aquaculture landing sites (hygiene, supply of clean ice and seawater, etc.) US\$100,000;
3. Upgrade of fishing vessels or aquaculture ponds US\$110,000 in the first year;
4. 10% annual operating and maintenance with a total of US\$460,000 over 10 years.

The number of units and unit costs for construction or upgrade can be adapted to each country and therefore only the total investments (usually over 1st and 2nd year) are shown to provide an indication for the allocation of annual costs for private sector upgrading over a 10-year investment period. The overall cost for a 10-year period is US\$920,000 (Table 21. Detailed table in Annex 5 Section A5.1).

Table 21: Private sector costs to upgrade and operate SPS+ facilities (vessels and establishments)

	Investment Cost (US\$1,000)	Increase in annual operating cost
Upgraded factories	250	10%
Upgraded packing / landing facilities	100	10%
Upgraded vessels / farms	110	10%
TOTAL (US\$1,000) with operating costs over 10 years	920	

Compared with public sector costs, those for the private sector may seem low, given the potential high return and the high demand for fisheries and aquaculture products. A strong SPS+ compliant CA is a priority to ensure a sustainable investment environment (since it prevents non-compliant operators from undermining investments by compliant operators).

8.3.5 Compliance cost benefit analysis

Box 2 summarises the costs and benefits, over a 10-year period of the operation of an enhanced fishery sector SPS regime for a country exporting US\$30 million worth of fishery and aquaculture products. Estimated additional costs are US\$5.5 million to the public sector and US\$920,000 to the private sector (total US\$6.4 million). The benefits of the SPS+ arise from a 10% increase in export value over the baseline, estimated to be in the region of US\$30 million over 10 years, giving a benefit-cost ratio of 4.7:1. That is, for every US\$1 spent on upgrading the system and sector, US\$4.7 worth of economic benefits are generated over the life of the project. The detailed tables are given in Annex 5 Section 5.1.

Box 2: CBA Fisheries and Aquaculture Products Case Study

Benefits

- ⇒ 10% increase in annual export value (=US\$30m)
- ⇒ Increase in exports from US\$300 million to US\$330 million

Costs

- ⇒ Public sector US\$5.5 million; Private sector US\$920, 000
- ⇒ Total US\$6.4 million

Cost benefit ratio 1:4.7

(i.e. for every US\$1 spent on upgraded SPS system, US\$4.7 worth of economic benefits are generated)

8.4 Fresh and prepared Fruit and Vegetables

8.4.1 Fruit and vegetables production and trade

Plant crops are the largest commodity group exported by CARIFORUM countries. They represented US\$1.5 billion in 2014 or 45% of the overall agri-food trade value for the year (Table 14). While a number of important national productions, such as sugar cane and banana, lost their ACP preferential market access regime into the EU, the 2008 world economic crisis encouraged cheap imports of essential agricultural commodities, resulting in increased regional dependency on imports. Since then, several regional and national initiatives are aiming to improve the productivity, quality and resilience of the fruit and vegetable agricultural sub-sector⁵⁴, and to achieve 'food sovereignty'.

Production of fruit and vegetable crops by the 15 CARIFORUM countries is extremely diverse. According to the FAO⁵⁵, production over the 15 countries was close to 27 million tonnes in 2014, cultivated over 33 thousand km². The tonnage produced is dominated by sugar, followed by rice, in the largest agricultural economies, namely the Dominican Republic, Haiti, Guyana, Jamaica, Belize, and Suriname (Table 22).

⁵⁴. <http://www.cardi.org/commodities-themes/fruits-vegetables/>

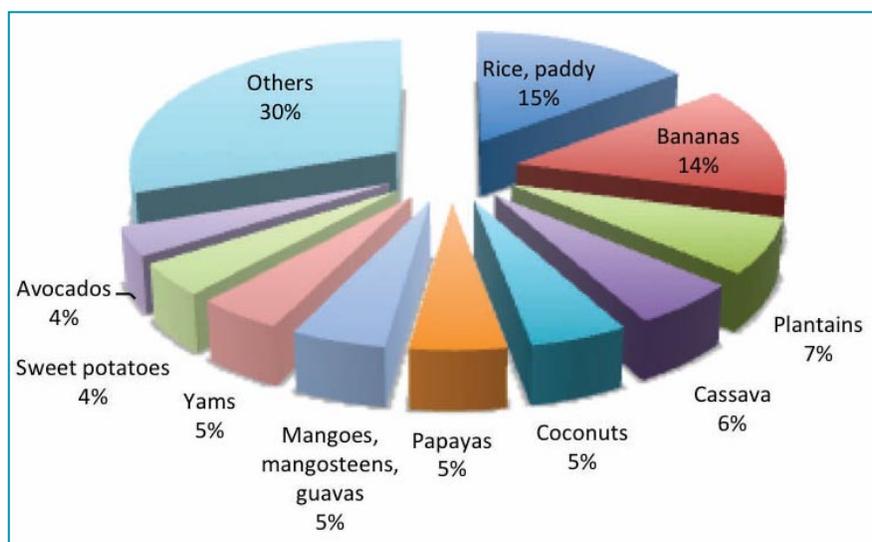
⁵⁵. FAOSTAT - <http://www.fao.org/faostat/en/#data/QC>

Table 22: Area cultivated for crops and tonnage produced in 2014

Country	Cultivated (km ²)	tonnes ('000)
Antigua and Barbuda	26	14
Bahamas, The	87	143
Barbados	126	182
Belize	951	1,673
Dominica	203	112
Dominican Republic	8,749	11,212
Grenada	96	39
Guyana	2,833	3,740
Haiti	16,938	6,066
Jamaica	1,478	2,845
Saint Kitts and Nevis	14	7
Saint Lucia	71	38
Saint Vincent and the Grenadines	154	119
Suriname	745	577
Trinidad and Tobago	325	127
TOTAL	32,796	26,894

Source: FAOSTAT

Leaving aside sugar cane, which represented nearly half of the total tonnage (12.5 million tonnes) produced by CARIFORUM countries in 2014, the other major crops are split between rice, bananas, and plantains (36%) and a variety of other fruit and vegetables (Figure 10).



Source: FAOSTAT

Figure 10: CARIFORUM agricultural crops in 2014 (12.4 billion tonnes without sugar cane)

In Jamaica, the country on which the ackee case study is based, crop production is typically diverse. In 2014, 63% of the tonnage produced was sugar cane, and the remaining 1 million tonnes consisted of 49 different produces, split into 9 fruit and vegetable categories. Unfortunately, the categories used in FAOSTAT are not directly compatible with the Harmonised System used for traded commodities. However, four main groups can be defined: i) Coconut, ii) Citrus, bananas, plantains, iii) Roots and tubers, and iv) Fresh vegetables (pumpkins, cabbages, tomatoes, etc.), which together represented 88% of Jamaica’s non-sugar cane crop production (Table 23).

Table 23: Fruit and vegetables produced by Jamaica in 2014 (without sugar cane)

Produce group	tonnes
Coconut and ground nuts	242,576
Citrus, bananas, plantains	239,328
Roots and tubers	235,063
Vegetables	225,188
Fresh fruit	84,085
Other vegetables	24,968
Coffee, cocoa	6,452
Others	4,856
Spices	2,719
Total	1,065,235

Source: FAOSTAT

There is no database to quantify the business structure of primary agricultural producers across all CARIFORUM countries, but from available studies and from meetings in the five countries visited, (unlike sugar, rice, and bananas), there appears to be little concentration at farm level in the fruit and vegetable sub-sectors. The majority of farms are small and family-run, and much of the population counted is likely to be involved in fruit and vegetable production.

In the ITC trade statistics, the fresh and prepared fruit and vegetables considered in the case study correspond to the following commodity groups and HS codes:

- HS 07 Edible vegetables and certain roots and tubers
- HS 08 Edible fruit and nuts; peel of citrus fruit or melons
- HS 20 Preparations of vegetables, fruit, nuts, or other parts of plants
- HS 21 Miscellaneous edible preparations

Exports values for these groups in 2014 are shown in Table 24 for all CARIFORUM countries. Overall, they accounted for regional exports of US\$325 million in 2014. Of these, products falling under HS Codes 07 and 08 (all of the fresh fruit and vegetables) accounted for 58% of the fruit and vegetable exports, and processed products under HS Codes 20 and 21 accounted for the balance. Based on Table 24, the main exporters (from the

highest to the lowest) are: the Dominican Republic, Belize, Jamaica, and Trinidad and Tobago, which together account for about 94% of the Region's fruit and vegetable exports.

Table 24: Exports of fresh and processed fruit and vegetable products from CARIFORUM countries in 2014 (US\$ thousand)

Exporters	HS 07 Edible vegetables and certain roots and tubers	HS 08 Edible fruit and nuts; peel of citrus fruit or melons	HS 20 Preparations of vegetables, fruit, nuts or other parts of plants	HS 21 Miscellaneous edible preparations	Totals
Antigua and Barbuda	12	-	3	148	163
Bahamas, The	0	-	1	69	70
Barbados	66	274	4,457	1,198	5,995
Belize	9,763	58,261	46,209	2,065	116,298
Dominica	724	2,036	274	431	3,465
Dominican Republic	107,437	409,629	51,714	169,863	738,643
Grenada	127	607	5	97	836
Guyana	692	6,611	2,676	1,588	11,567
Haiti	110	17,153	629	560	18,452
Jamaica	28,492	10,555	23,318	27,141	89,506
Saint Kitts and Nevis	12	10	33	33	88
Saint Lucia	34	6,722	103	737	7,596
Saint Vincent and the Grenadines	4,099	1,552	6	90	5,747
Suriname	1,366	0	1,434	3,101	5,901
Trinidad and Tobago	1,397	364	22,520	35,140	59,421
CARIFORUM Total	154,331	513,774	153,382	242,261	1,063,748

Source: ITC Trademap Database

8.4.2 SPS concerns

There are several important concerns with fresh and processed fruit and vegetables produced by CARIFORUM countries. The main concerns, as identified by border rejection and through interviews are:

- Residues of harmful pesticides, or excessive levels of permitted ones;
- Transmission of plant pests in live plant materials and fresh produce; and
- Presence of natural toxins in some food plants.

Regarding pesticide residues, problems arise particularly from production practices and variation between countries. The Dominican Republic is the largest exporter, and is also the country with the greatest number of rejections. The European Commission found that whilst 100% of bananas imported from the Dominican Republic were satisfactory in 2010, for other fruits and vegetables, 176 consignments out of 2,018 analysed (8.7%) were

not satisfactory⁵⁶. Therefore, products from the Dominican Republic have been subjected to additional border inspection checks. At some periods since 2010, the frequency of physical checks on mangoes, aubergines, bitter melon, yard long beans and peppers imported from the Dominican Republic has been as high as 50%.

The importer pays for the inspections and analytical costs in the EU and reflects these in the final payment and the price offered in the future. In practice, therefore the cost is passed on to the exporter and ultimately to the farmers. Repeated problems with fresh produce, either in the EU or the US, can result in the farmers being dropped by exporters.

Poor regulatory controls of pesticides and their applications gives rise to the problems experienced. Several countries visited in the study have mentioned illegal imports of banned pesticides and old stockpiles used by small farmers. Pesticide residue testing is required to check that the control system is functioning, and to highlight specific risk crops and areas through monitoring. There is only one accredited pesticide residue testing laboratory in the region, although several non-accredited ones can undertake screening. Market access for exported produce is therefore limited by not being able to verify compliance with pesticides residue limits throughout the region.

Another major concern in the fresh fruit trade is the transmission of the non-native fruit flies, which can cause considerable damage and accelerated spoilage. Importing countries are therefore keen to apply measures to prevent their entry, such as allowing import only from pest free countries or zones, or requiring suitable treatment (for examples mangoes treated with hot water, steam, or irradiation to kill the eggs and larvae). The absence of such compliance means that several countries in the region have not been able to optimise their fresh fruit production and exports.

The trade consequences of potential poisoning from a plant food product is illustrated with the case study of canned ackee in Jamaica, which has been extensively studied and described by André Gordon of TSL Services⁵⁷. Ackee (*Blighia sapida*) is a tree fruit produced in several countries in the region, notably Jamaica, Belize and Haiti. The fruits are used cooked as a vegetable, and are highly valued in the Caribbean and by chefs living abroad. Unless fully ripened, fresh whole ackees contain a natural heat-stable toxin, which if ingested, may cause mild to severe reactions. Ackees are collected from small producers, processed, and canned to be exported. The toxin may be found if the fruit is incorrectly harvested and processed without sufficient ripening, and the US market currently has an import alert in place⁵⁸ for canned ackee under 'Foodborne Biological Hazards'. As a result of the alert, the numbers of exporters are restricted to those who have demonstrated adequate controls of the hazard, now to be confirmed by inspections under the FSMA. A total of 13 exporters are currently green-listed by the US FDA (one each in Haiti and Belize, and 11 in Jamaica) and thus permitted to supply the US. For all other firms, products are to be detained without physical examination, and only released subject to satisfactory test results. The cost of this is reported to be sufficient to discourage them from supplying the US market, and a strengthening of the SPS conditions is key to both production and export. Similar concerns exist for other processed products, such as fruit drinks containing guanabana (soursop), which can present toxicity due to the presence of the toxic seeds. The US has a red list in place for specific companies that have been found to be persistent offenders.

⁵⁶. European Commission, Results of border checks carried out by EU Member States and Norway on the imported products listed in Annex I to Regulation (EC) No 669/2009 Consolidated data for 2010 http://ec.europa.eu/food/safety/docs/oc_leg_imports_dpe_ms_border-checks-results_2010.pdf

⁵⁷. Interview October 2016.

⁵⁸. Alert # 21-11 http://www.accessdata.fda.gov/cms_ia/importalert_64.html

8.4.3 Benefits under compliant SPS+ system

The consultants studied the quantifiable costs and benefits of compliance in relation to trade in processed ackee in more detail, and this data provides the basis for the cost benefit analysis. Canned ackee represents small volumes of production (2,067 tonnes) and trade value (US\$14 million), but it is the best-documented instance of the impact of implementing a fruit and vegetable production standard for export in terms of costs, benefits and precise SPS diagnostic and solutions. The information was derived from personal interviews with key informants and a number of books and papers (Gordon, 2015 and 2016).

The benefits observed in Jamaica as a direct result of improved SPS production standard over 10 years were an increased number of SPS-compliant processing factories, an increased production volume (by 23%) and an increased unit price (by 4%), as indicated in Table 25.

Table 25: Benefits of SPS+ scenario assumed for Jamaica Canned Ackee

Benefits under SPS+	
Increased production	<ul style="list-style-type: none">○ Increased number of SPS-compliant processing establishment○ Production increased by 23% over 10 years
Increased first sale value	<ul style="list-style-type: none">○ 4% unit price (US\$/t) increase over 10 years○ Increased export value of US\$18 million over 10 years

8.4.4 Costs of compliant SPS+

Following incidents of food poisoning in the US (whose cost is not included in the CBA) exports of ackee were severely restricted by FDA sanitary measures and limited to 'green listed' processors. A major compliance programme, including investments by the Government of Jamaica and the private sector, helped to recover the trade.

Public sector costs

Detailed costs for upgrading of the Competent Authority are based on the field mission to Jamaica, published literature, and discussions with stakeholders. They are given in Table 26 below. The costs relate to the export of an initial quantity of 2,067 tonnes of canned ackee products worth US\$14 million.

The annual costs of public sector upgrade were estimated over a 10-year investment period. The model assumes upgrading of the regulatory framework, competent authority facilities and upgrading of laboratories. In addition, in this case the government also supported industry with a substantial programme of sector support comprising grants and extension services. Based on these investments, over a 10-year period the public-sector cost of upgrading the SPS system was estimated to be US\$840,000 for the CA, plus US\$1 million on laboratories and US 75,000 on sector support.

Based on the initial investments (over 2 years) and the associated operating costs over a 10-year period, the cost of upgrading the competent authority is estimated to be US\$2.9 million over 10 years (Table 26. Detailed table in Annex 5 Section A5.2).

Table 26: Estimated public sector costs in establishing and operating a competent authority for export of ackee

	Cost (US\$1,000)	Increase in annual operating cost
System upgrade (legal, certification, software)	40 (every 5 years)	10
CA facilities (office, vehicles, equipment)	765	15%
Laboratory (facilities, equipment, accreditation)	40	25%
Sector support	750	
TOTAL (US\$1,000)	2,879	

Private sector costs

SPS-compliant production was assisted by the technical support from the Government, private expertise, and benefited from strong support and FDA expertise. The main challenge at first, was to identify the processing stage that led to the presence of the toxin, then to devise operations that could guarantee safety of the final product, through the harvesting, drying, peeling and canning stages. Once this was done, processors had to upgrade their establishment and the producers (farms) had to meet the FDA requirements.

For the canned product, which is a very short value chain, the private sector investments necessary to meet the FSMA Food Safety Plan included in the model are as follows:

1. Upgrade of processing factories (preparation, canning), US\$114,000 in the first year, for each of 10 processors (US\$1.14 million);
2. Upgrade of farm-based collection sites (choice of ripe ackee, hygiene, etc.) US\$29,000 for 5 sites or US\$143,000;
3. 10% annual operating and maintenance for a total of US\$1,283 over 10 years.

The total private sector investment and operating costs over 10 years are taken to be US\$2.6 million (Table 27. Detailed table in Annex 5 Section A5.2).

Table 27: Private sector costs to upgrade and operate SPS+ facilities (vessels and establishments)

	Investment Cost (US\$1,000)	Increase in annual operating cost
Upgraded factories	1,140	10%
Upgraded farm – based collection	143	10%
TOTAL (US\$1,000) with operating costs over 10 years	2,565	

Here it is important to note that the number of sites and unit costs are given for illustration purposes. It makes no difference to the CBA analysis if there are 10 factories at a cost of US\$114,000 each, or 5 factories at a cost of US\$228,000 each (or just one at a cost of US\$1.14 million).

8.4.5 Compliance cost benefit analysis

The operation of the enhanced SPS regime are shown in Table 28. Export value will rise from US\$13.8m to US\$17.5m and is estimated to incur additional costs of US\$2.9 million in the public sector and US\$2.6 million in the private sector (total US\$5.7 million), the net benefit is estimated to be in the region of US\$18 million over 10 years giving a benefit cost ratio of 1: 3.32 (see Box 3). That is, for every US\$1 spent on upgrading the system and sector, US\$3.3 worth of economic benefits are generated over the life of the project. The detailed tables are given in in Annex 5 Section A5.2.

Table 28: Trade benefits over 10 years from strengthened SPS compliance for Jamaica Canned Ackee example

Export	Year									
	1	2	3	4	5	6	7	8	9	10
Volume (tonnes)	2,067	2,114	2,163	2,212	2,263	2,315	2,368	2,422	2,477	2,534
Unit value \$/t	6,666	6,693	6,721	6,748	6,776	6,804	6,832	6,860	6,888	6,916
Value US\$ (1,000)	13,779	14,152	14,535	14,929	15,334	15,749	16,176	16,614	17,064	17,527

Box 3: CBA Canned Ackee Case Study

<p>Benefits</p> <ul style="list-style-type: none"> ⇒ 4% increase in export price ⇒ 23% increase in export volume ⇒ Increase in export value (from US\$138 million to US\$156 million) <p>Costs</p> <ul style="list-style-type: none"> ⇒ Public sector US\$2.9 million; ⇒ Private sector US\$2.6 million ⇒ Total cost US\$5.7 million <p>Cost benefit ratio 1 : 3.3</p> <p>(i.e. for every US\$1 spent on an upgraded SPS system, US\$3.3 worth of economic benefits are generated)</p>

8.5 Poultry products

Poultry 'Broiler' meat is a most important agri-food item in the Caribbean and a key contributor to food security. It is the largest source of protein consumed per capita (40kg per person per year across CARIFORUM countries).

Chicken meat is sold cooked through fast food outlets, shops, and restaurants, and fresh through 'pluck shops', where customers choose their birds live to be slaughtered and plucked on the premises. For home cooking, consumers prefer live sales, which represent between 28% and 89% of sales depending on the countries⁵⁹.

The poultry sub-sector is chosen for a case study for two main reasons, in addition to its social and economic importance and its specific SPS challenges:

- First producers are organised into National Producer Organisations grouped under the Caribbean Poultry Association (CPA). The CPA collates and shares quantitative information, which for other commodity groups are notably missing. Although the data are not centralised for the CARIFORUM grouping, official statistics are relatively good for the Dominican Republic and therefore can be aggregated with those of the CPA;
- Second, national organisations are very aware of international trade issues and have, for some years, pursued an objective to displace poultry meat imports for the countries to have a level of self-sufficient production. The growth of regional trade is also a key objective, leading to solidarity to help rebuilding production in countries affected by hurricanes and other natural disasters.

8.5.1 Production and Trade

In 2012, the last year with complete national production statistics, the production of poultry for broiler meat was more than 0.9 million metric tonnes, while annual consumption in the CARIFORUM region was estimated to be at least 1.04 million tonnes (see Table 29). The region is therefore, overall, about 80% self-sufficient. The Dominican Republic is the largest producer in the region by far, with more than 550 000 tonnes produced in 2012, followed by Jamaica (101 000 tonnes), Trinidad and Tobago (65 000 tonnes), Guyana (30 000 tonnes), Barbados, Belize, and Suriname (all >10 000 tonnes). In 2012, Barbados, Belize, the Dominican Republic and Guyana were all substantially (>90%) self-sufficient.

However, the region also imports substantial volumes of poultry. Even larger producer countries, such as Barbados, Belize, the Dominican Republic, and Guyana, may import around festive seasons, carnivals, and special events. Imports were 234,000 tonnes in 2012, which was 25% of the tonnage produced and 20% of consumption (Table 29 overleaf). However, for most of the smaller island countries, more than 90% of the poultry are imported.

Exports of broiler meat (specifically commodity group HS0207) were minimal, with 10,400 tonnes (just above 1% of the region's production), and were essentially to neighbouring Caribbean countries (although not all CARIFORUM). The largest exports of poultry meat were from the Dominican Republic to Haiti, from Jamaica to the Cayman Islands, Antigua and Barbuda to Montserrat, Trinidad and Tobago to Suriname, Suriname to Guyana, and Barbados to Antigua and Barbuda. Exported quantities doubled in 2014 for the same countries, but remain negligible at 22,000 tonnes overall.

Imports into CARIFORUM countries originated mostly from the USA (83%) and to a lesser extent Brazil (9%), Canada (3%) and CARIFORUM countries (3%) in 2012, with a slight growth for the shares from Brazil (10%), Canada (4%) and CARIFORUM (4%) in 2014 (Figure 11). The development of regional production and exports is currently limited by competition from cheaper foreign imports, despite a relatively high degree of tariff protection for some countries seeking to encourage the development of their national poultry meat production.

⁵⁹. <http://caribbean-poultry.org>

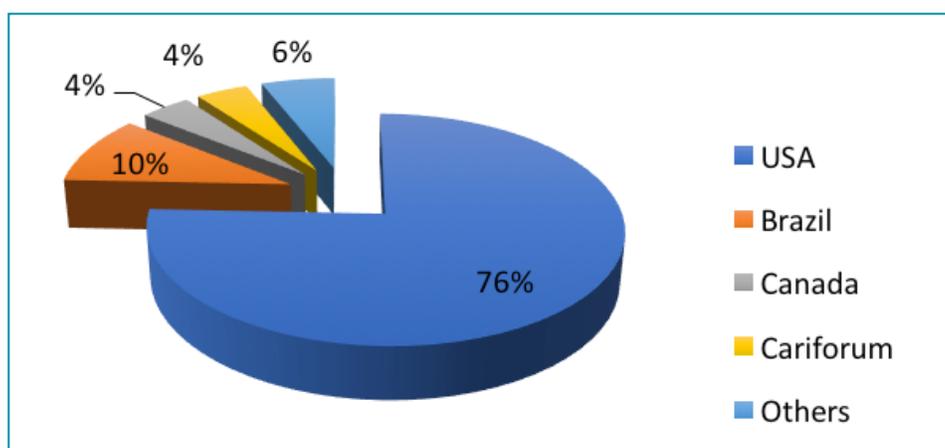


Figure 11: Origin of CARIFORUM of poultry meat (% HS0207 US\$321,216) imported in 2014

Table 29: CARIFORUM broiler meat (HS0207) production and trade in 2012 and 2014

Country	Production 2012 (tonnes)	Rank in region	Imports 2012 (tonnes)	Exports 2012 (tonnes)	Self-sufficiency P/(P+I)	Imported tonnage 2014	Imported Value 2014 (US\$1 000)	Exported tonnage 2014	Exported Value 2014 (US\$1 000)
Antigua and Barbuda	335		8,461	220	4%	5,828	12,112	71	78
Bahamas, The	6,362		7,026		48%	8,581	45,532		
Barbados	15,339	5	1,125	49	93%	1,490	3,433	70	308
Belize*	14,043	6	25		100%	26	23	-	-
Dominica	260		8,707	4	3%	3,836	6,909	51	199
Dominican Republic	554,212	1	3,643	9,225	94%	23,764	46,087	17,646	10,138
Grenada	402		5,923		6%	6,510	10,823	2	10
Guyana	30,338	4	2,207	9	93%	644	782	-	-
Haiti	7,577		76,011		9%	78,657	77,041		
Jamaica	101,382	2	39,415	244	72%	37,900	32,178	319	1,228
St. Kitts/Nevis	137		3,401		4%	3,367	5,858	-	8
St. Lucia	1,501		10,424		13%	9,340	14,258		
St. Vincent & the Grenadines	467		6,482		7%	7,594	11,700	3	12
Suriname**	10,142	7	18,206	152	36%	18,744	22,669	3,230	3,353
Trinidad & Tobago	65,150	3	19,038	493	77%	23,378	31,811	470	1,364
Total	923,435		234,320	10,396		229,659	321,216	21,862	16,698

Source: CPA and Dominican Republic for Production; TradeMap for Imports. Includes *turkey and **duck meat.

There are a few integrated high-density units and a very large number of small 'cottage' producers. A summary of the industry structure is given in Box 4. Fully vertically integrated producers are located in Jamaica, Barbados, Belize, Guyana, Trinidad and Tobago and the Dominican Republic. These firms undertake all production and processing stages, and supply inputs (chicks, feed) and protocols to contracted out-growers. In this way traceability, SPS and other risks can be controlled.

Box 4: CARICOM Poultry Industry Structure in 2014

- Total Industry Investment at 2014 prices: US\$850 Million
- Commercial Hatcheries: 19; 1 chick exporter (Barbados)
- Tunnel-Ventilated farms in Barbados, Belize, Guyana, Jamaica, and Trinidad & Tobago
- 11,100 Cottage Processors
- 19 line-processing plants; 6 further processing plants; largest line processing plants in Jamaica; smallest line processing plants in Belize and Suriname.
- 1 Egg Processing Plants
- 61,900 direct employment in the Industry; 33,500 indirect employment
- 17 Grain Terminals; 20 Feed Mills; Feed input producers: Belize (corn), Guyana and Suriname (Rice), Guyana and Trinidad & Tobago (Fish Meal), Dominica, Guyana, Suriname (Coconut Meal)
- Feed input exporters: Belize (Corn). Guyana and Suriname (Rice)
- Industry-owned cargo ships: 2; Industry-owned aircraft: 1

Source: Caribbean Poultry Association 2016

For the CARICOM, the CPA estimated employment to be around 100,000 in 2012, to which figures for the Dominican Republic must be added. CARICOM producers are organised into the CPA, a strong organisation that holds conferences to discuss emerging issues around scientific and policy presentations and lobby to shape regional policies. It also compiles regional statistics, although unfortunately excluding the Dominican Republic to this date (2016).

Broiler meat production has seen very high annual growth across CARIFORUM countries. A recent study of the poultry value chain in Saint Lucia shows an annual increase in broiler production of around 20% between 2009 and 2013 (Wallace, 2015). By 2012, national productions seem to have reached a plateau; although Jamaica Broilers (JB Group Ltd) recently announced a planned increase of its productive capacity by about 25%⁶⁰. Given the level of imports in 2014, the year for complete statistics, there is still an enormous production potential if intra-regional trade can be organised.

8.5.2 SPS concerns and risks

There are several serious SPS concerns for poultry meat producers and processors at present (Edmund CPA, 2014). These are:

- (i) Risks of avian influenza for the production of farmed birds;

⁶⁰ <http://www.wattagnet.com/articles/25507-jamaica-broilers-looks-to-raise-capacity-by---percent>

- (ii) Risks to human health from microbial infections of poultry products at the farm, slaughtering and processing levels; and,
- (iii) Potential risks linked to residues use of hormones and antibiotics in poultry feed

In recognition of the high SPS risks linked to poultry products, the EU has poultry-specific requirements for live and raw (including frozen) products. In particular, non-EU countries of origin must be on a positive list and must be members of the OIE, and imports are only authorised from approved establishments (see EU Trade Factsheet 2015⁶¹).

Specifically, the EU requires that exporting countries have the following systems in place:

- Adequate veterinary competent authorities structured and resourced enough to undertake inspections and guarantee required veterinary and hygiene conditions throughout the food chain,
- Avian influenza surveillance program
- Salmonella control program
- Monitoring system for residues of veterinary medicines, pesticides, and contaminants.

Avian influenza is a notifiable disease and a major public health concern worldwide, for the losses it causes to poultry production, and threat to human health. Possible outbreaks must be monitored and reported to the OIE, which has a joint Task Force with FAO and the WHO. In the region, the Caribbean Animal Health Network, CaribVET⁶², hosts the monitoring network under the aegis of the French agricultural research and international cooperation organization (CIRAD) in Martinique. Annual conferences to share research and coordinate activities are supplemented by training, mock interventions, and shared laboratory testing. Once the presence of disease is detected and notified, restrictions are immediately placed on the movement and trade of live birds through concentric areas of restricted movements. At this time (2016), the only strategy in case of outbreaks is the destruction of infected stocks or 'stamping out' at enormous costs to producers and the associated value chain.

Existing infections in Canada, the US and Mexico pose important risks to producers in Caribbean countries, through movement and trade of live farmed animals, which appear to be common in poultry farms. There is also a risk from migrating wild birds that can carry the virus. Depending on the strains of the virus, some highly pathogenic (HPAI), mortalities in farmed birds can be important. There have also been some cases of transmission to farm workers in Asia, causing illnesses or even death, and although these have been rare, the WHO takes extremely seriously the threat of mutations that would make human-to-human transmission possible. An important problem with the infection is the rapid virus mutations from one year to the next and within years, which challenges the effectiveness of vaccination programmes, especially for short-lived broiler-meat birds. Another challenge is linked to the diversity of strains, with low pathogenic strains (LPAI) that can be difficult to detect and monitor. And another challenge comes from the diversity of the industry, with large numbers of small rural production units, which may provide higher welfare and therefore more resistant free-range birds but may also increase potential transmission from wild to farmed birds and unreported movements.

⁶¹. https://ec.europa.eu/food/safety/international_affairs/trade/poultry_en

⁶². <http://www.caribvet.net/>

Among CARIFORUM countries, the Dominican Republic had an incident in 2007 with an infected fighting cock diagnosed in Haiti. Since then, Haiti has banned trade of live poultry from the Dominican Republic. More recently, Belize had an outbreak of LPAI in September 2014, which was stamped out and the country declared free of avian influenza by June 2015. Quarantine control measures and the direct losses borne by the producers in the infected area (even with an effective containment) cost government and the poultry industry over US\$3 million (BZ\$6 million, CaribVET). This included US\$1.6 million for the depopulation of affected and neighbouring areas. In retrospect, the costs appear relatively low, given a wholesale value of the Belize poultry sector of US\$100 million. Costs can be compared to a recent outbreak of HPAI in duck farms in the south west of France, which involved similar depopulation costs, but much higher (US\$17 million) costs from loss of production and upstream and downstream for a high value added product. Costs in France are, in part, raised by the compensation programmes to farmers for lost production, and by the cost of insurance, which are not currently in place in Belize. In any case, the successful notification, isolation and stamping out in Belize, made possible from the combined efforts of the Competent Authority (BAHA) and Producer Organisation (BPA), is exemplary.

The risk of **microbial infections** to consumers is a chronic SPS problem of poultry meat and egg production, and a very common source of food poisoning in humans. The Centers for Disease Control and Prevention (CDC) estimates that Salmonella is the cause of one million foodborne illnesses in the United States, with 19,000 hospitalizations and 380 deaths each year⁶³. Salmonella is common around poultry and many serotypes have been isolated, particularly in larger egg laying farms (Adesiyun A. et al, 2014). In Trinidad and Tobago, a study found the egg-associated *S. enteritidis* (SE) and illnesses linked to recent (4 days) consumption of raw or undercooked eggs (Indar-Harrinauth L, et al., 2001). As a result, awareness campaigns recommend that eggs be refrigerated and veterinary health authorities have regular monitoring in place⁶⁴.

Finally, safety of consumers from **residues of veterinary medicines, pesticides and contaminants** in poultry products is also very important. A recent presentation to the CPA noted that guidelines and regular SPS inspections are required to ensure safe use of hormones and antibiotics in poultry feed (Edmund CPA, 2014). The FDA requires specific licences for feed mills to produce medicated feeds, and complete traceability has to be established if these are used (or feed is imported from the US), to ensure product safety before being put to market.

The CARIFORUM countries capacity to produce poultry feed (see Box 4) is increasing, and according to the CPA, most producers do not use hormone or antimicrobial growth promoters. Control and monitoring is needed to ensure that only approved veterinary treatments are applied, and that withdrawal periods are observed, and that the products are free of environmental contamination and residues. In this respect, the need for adequate monitoring programmes and laboratory-testing capacity (national, regional, or foreign) is shared with all livestock feed production (including the emerging aquaculture sector) and with most agri-food production, including fresh and processed fruit and vegetables, grains, seeds and spices.

8.5.3 Benefits under compliant SPS+ system

The central assumption in the modelling of the benefits of the SPS+ scenario in the poultry sub-sector is that the benefits will arise from a displacement of imports, as improved SPS control results in increased confidence of investors to finance the development of additional production capacity. Therefore, the benefit in terms of

⁶³ <https://www.cdc.gov/salmonella/index.html>

⁶⁴ https://www2a.cdc.gov/epicasestudies/graphics/salm_i.pdf

trade is a reduction of the trade deficit, coupled with the corresponding increased value added from domestic production. A detailed country-by-country analysis of the sub-sector was beyond the scope and time available for this study, but given that good data was available at the regional level from the CPA statistics, a hypothetical average CARICOM country was described as the basis for the modelling of the costs and benefits of the SPS+ scenario (Table 30).

Table 30: Benefits of poultry SPS+ scenario assumed a ‘typical’ CARIFORUM country

Benefits under SPS+
<p>‘Improved’ trade</p> <ul style="list-style-type: none"> ○ International trade for poultry meat (HS0207) decreases as net imports (imports-exports) are displaced. Imports are displaced at a year-on-year rate of 15%. After 10 years, net imports are reduced to 46% of initial baseline value (US\$17.3 million net imports per year). After 10 years, the trade displaced is worth US\$80.4 million. ○ Regional trade is improved (not quantified as a benefit)
<p>Increased production</p> <ul style="list-style-type: none"> ○ The benefit generated corresponds to the value added by producing locally, taken to be 20% of the value of imports displaced. For the value of US\$80.4, the resulting net benefit of US\$16 million over 10 years. ○ Increased quantities produced by the SPS compliant operations to make up displaced imports (not quantified as benefit).

Source: own compilation

8.5.4 Costs of compliant SPS+

For this case study, the public and private sector costs were based on data obtained from the interviews during the field mission, supplemented by available reports. The estimated costs are as follows.

Public sector costs

The cost items are estimated for a dedicated SPS+ systems upgrade and cover software, certification, offices, equipment, and infrastructure facilities as described for the two other case studies. They are summarised in Table 31 below, and detailed in Annex 5 Section 5.3.

Total public costs, for a country producing around 13,000 tonnes and importing US\$17 million of poultry products per year, to upgrade its SPS system over 10 years are estimated to be US\$3 million.

Investments over a 10-year period are taken to be as follows:

- Competent authority (systems, offices, infrastructure) US\$270,000 with 12-15% operating costs
- Laboratories (infrastructure, equipment) US\$400,00 and 25% operating costs
- Sector support (extension, training) US \$1,000,000 on sector support.

Based on the initial investments (over 1 or 2 years) and the associated operating costs, over a 10 year period the cost of upgrading the competent authority is estimated to be US\$2.98 million over 10 years (Table 31. Detailed table in Annex 5 Section 5.3).

Table 31: Estimated public sector poultry import displacement in a ‘typical’ CARIFORUM country

	Cost (US\$1,000)	Increase in annual operating costs
System upgrade (legal, certification, software)	120	12%
CA facilities (office, vehicles, equipment)	150	15%
Laboratory (facilities, equipment, accreditation)	400	25%
Sector support	1,000	
TOTAL (US\$1,000)		2,980

Private sector costs

Regarding SPS compliance, there is a clear split in the poultry industry:

- The larger private sector operators have internalised costs by developing stringent in house systems. They enforce these on their contract farmers and increase production by increasing the size of production units; and
- All other producers, usually family-run mixed-livelihood businesses have less capacity to keep records, to organise collectively or invest in compliant traceability systems and SPS+ compliant premises.

Costs to review biosecurity and upgrade production and processing facilities are assumed to be between US\$2,000 and US\$500,000 per unit, depending on size. For the average sector, an investment of US\$500,000 is envisaged over the first two years to upgrade the processing capacity, and another of US\$1 million over the first two years, for production sites. Operating costs are taken to be 15% of the investments, with an additional operating budget of US\$2.1 million over 10 years (Table 32, with details in Annex 5 Section 5.3).

Private sector operating costs include the maintenance of all necessary and feasible (for smaller operators⁶⁵) food safety production systems (HACCP, GMP, Quality Management Systems⁶⁶) and US FSMA Food Safety Plans. Whether such investments are in aid of smaller or larger production and processing units is a matter of national policy.

The number of sites and unit costs are given for illustration purposes. It makes no difference to the CBA analysis if there are 20 tunnel-ventilated farms at a cost of US\$50,000 each, or 10 at a cost of US\$100,000 each.

⁶⁵ e.g. Broiler Value Chain in St. Lucia, Wallace 2015

⁶⁶ See for example CB Group in Jamaica: <http://ilovecbfoods.com/why-were-different/>

Table 32: Private sector costs to upgrade and operate SPS+ additional poultry facilities

	Investment Cost (US\$1,000)	Increase in annual operating cost
Upgraded processing sites	500	15%
Upgraded production sites	1,000	15%
TOTAL with operating costs over 10 years (US\$1,000)	3,638	

8.5.5 Compliance cost benefit analysis

Bringing together the expected benefits and estimated costs over a 10-year period described above, the operation of an enhanced SPS regime for a poultry-producing country displacing US\$80.4 million worth of imports, results in US\$16 million of value added by national producers. This is estimated to incur additional costs of US\$2.9 million in the public sector and US\$3.6 million in the private sector (total US\$6.6 million). The benefit is estimated to be in the region of US\$16.1 million over 10 years giving a benefit cost ratio of 1:2.4. That is, for every US\$1 spent on upgrading the system and sector, US\$2.4 worth of economic benefits are generated over the life of the project. The detailed tables are given in Annex 5 Section 5.3.

Box 5: CBA CARIFORUM Poultry Case Study

Benefits

- ⇒ Imports reduced from US\$173m to US \$92m
- ⇒ US\$16.1m (value added on substituted imports = 20% of value)

Costs

- ⇒ Public sector US\$3 million; Private sector US\$3.6 million
- ⇒ Total US\$6.6 million

Cost benefit ratio 1 : 2.4
 (i.e. for every US\$1 spent on upgraded SPS system, US\$2.4 worth of economic benefits are generated)

9 CARIFORUM REGIONAL AND NATIONAL COST BENEFIT ANALYSIS

9.1 Application of the case studies to the CARIFORUM agri-food trade

The previous section has demonstrated that there are positive benefits to be obtained in the specific sectors of fishery products, and fruit and vegetable exports, and in import substitution for products of animal origin. In this section, the findings are extrapolated to the remaining sectors of the agri-food export businesses, with a view to estimating the potential regional benefits for enhanced SPS controls across all commodities.

The three specific case study analyses presented in Section 8 cover only a small proportion of the total trade in agricultural products and food (estimated to be just 1% in the case of fish exports and ackee just 0.1%). The segments of which the case studies are representative, comprise a much greater proportion of trade. Here trade in fishery products accounts for about 10% of exports, and the fruit and vegetable sector 47%. For imports, the poultry case (a hypothetical country importing about 13,300 tonnes per year) accounts for just 0.3% of imports of agri-food, but the poultry sector accounts for about 6%. However, the arguments in terms of cost and benefits of investment in the SPS+ scenarios can be applied to the sectors with a high degree of reliability, since there are strong similarities in the SPS control challenges.

However, not all sectors are as sensitive as the case study commodities to SPS hazards. Therefore, to avoid over-estimating the costs and benefits of fully compliant SPS conditions, the consultants have taken a pragmatic approach that reflects the relevance of enhanced SPS measures to other sectors highly sensitive to SPS measures. Table 33 shows the categorisation of sectors as the basis for the extrapolation of the case study results.

Impacts on fishery products were applied directly from the case study to the fishery product category (HS 03). Impacts on the SPS fruit and vegetable sector were applied from the case study to HS 07,08,09,11,12,18, 20 and 21) i.e. it was assumed that the costs and benefits of SPS+ in these sectors would be the same proportionally as for ackee). Other exports (HS 10,17, 19 and 22) were assumed to be SPS neutral (i.e. either not sensitive to SPS measures or that existing measures were sufficient, with no investment required, and no benefits from SPS+). These products account for about 50% of CARIFORUM export value in 2014.

Live plants and animals, were ignored due to the small level of trade concerned. In terms of imports, it was assumed that the import substitution impacts of the poultry case could be equally applicable to other meat, dairy and process animal products (HS 02,04,15 and 16) and that other sectors would be unaffected.

Based on these assumptions, it is therefore possible to apply the results of the case study CBAs to the agri-food trade pattern of the region as a whole, as described in the next section.

Table 33: CARIFORUM's international trade in agri-food products 2014 (US\$ million)

HS	Product label	Exported value in 2014	Imported value in 2014
HS	Agrifood products	3,427	7,455
03	Fish and crustaceans, molluscs and other aquatic invertebrates	319	293
07	Edible vegetables and certain roots and tubers	154	259
08	Edible fruit and nuts; peel of citrus fruit or melons	514	193
09	Coffee, tea, maté and spices	49	86
11	Products of the milling industry; malt; starches; inulin; wheat gluten	155	285
12	Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit...	13	157
18	Cocoa and cocoa preparations	259	71
20	Preparations of vegetables, fruit, nuts or other parts of plants	154	384
21	Miscellaneous edible preparations	242	665
	Subtotal: All Fresh and processed fruit and vegetables	1,540	2,100
10	Cereals	322	1,112
17	Sugars and sugar confectionery	364	344
19	Preparations of cereals, flour, starch or milk; pastry cooks' products	200	589
22	Beverages, spirits and vinegar	504	767
	Subtotal: Others – Beverage, Cereals and Sugars	1,390	2,812
01	Live animals	16	25
06	Live trees and other plants; bulbs, roots and the like; cut flowers ...	7	27
02	Meat and edible meat offal	19	661
04	Dairy produce; birds' eggs; natural honey; other edible animal prod.	34	701
15	Animal or vegetable fats and oils	69	554
16	Preparations of meat, of fish or other aquatic invertebrates	34	280
	Subtotal: Meat and poultry products	156	2,196

Source: Compilation from ITC – TradeMap

9.2 Regional CBA of enhanced SPS compliance on trade

The overall costs and benefits to regional trade of enhanced SPS compliance over a 10-year period are shown in Table 34 overleaf. Over this period, for an additional annual public cost of US\$51.4 million in strengthening the competent authorities and their control systems across all 15 countries, and an annual investment of US\$46 million by the private sector, improved SPS status will generate trade benefits from agri-food products after 10 years of US\$306 million/year. This means that the estimated annual benefits are just over three times the annual costs, or for every US\$1 spent (by public and private sector) trade benefits of US\$3.14 are derived.

Table 34: CARIFORUM Regional costs and benefits of enhanced SPS compliance over 10 years (US\$ million)

Commodity groups	Over 10 years						BC ratio	Per Year	
	Baseline	SPS+						SPS+	
	Trade	Public costs	Private costs	Total Compliance costs	*Trade SPS+	Trade Benefits		Costs /year	Benefits / year
	US\$ million							US\$ million	
<i>Fish - CBA</i>	300	5.5	0.9	6.4	330	30	4.68	1	3
All Fishery products	3,186	58.3	9.8	68.1	3,505	319	4.68	7	32
<i>Fruit & vegetables - CBA</i>	138	2.9	2.6	5.4	156	18	3.32	1	2
All Fresh and processed fruit & vegetables	15,389	321.5	286.5	608.0	17,407	2,018	3.32	61	202
Others: Beverage, Cereals and Sugars	13,891	-	-	-	13,891	-	-	-	-
Others: Live animals and plants	232	-	-	-	232	-	-	-	-
Total Exports	32,698	380	296	676	35,035	2,337	3.46	68	234
<i>Broiler meat - CBA*</i>	173	3.0	3.6	6.6	80	16	2.43	1	2
All Meat products*	7,797	134	164	298	3,622	724	2.43	30	72
Meat with Poultry Import replacement	7,797	134	164	298	3,622	724	2.43	30	72
Total costs and benefits		514	460	974		3,061	3.14	97	306

*Trade gains = VA displaced imports for Poultry HS02

Public sector costs were estimated separately for fisheries and aquaculture, for fresh and processed fruit and vegetable, and for meat products. The costs and benefits for the groups 'Beverages, Cereals and Sugars' and 'Live Animals and Plants' were assumed to be covered by the estimations of the three others groups. The trade in 'Live Plants and Animals' could carry enormous risks, but is currently very limited and non-trade benefits could be enormous through enhanced protection of disease-free national animal and plant health status. The trade in beverages and sugars is very large, second only to the fresh and processed fruit and vegetables in trade value (US\$15 billion exported in 2014). Here producers and processors are generally larger, with good access to finance and a good intelligence of SPS+ and the current model assumes that the sub-sector is neutral with respect to SPS+ costs and benefits. However, this sector is also one that could have a higher Benefit Cost ratio from cost-efficient GMPs, TBT compliance and private certifications, all being outside the scope of this study.

SPS+ systems are often separated between animal and plant-related SPS systems, but economies of scale can be made when some laboratories and technical services are pooled across Agriculture Health Services. For example, food safety testing laboratories testing for heavy metals, or microbiological safety of foods can readily apply their analytical methodologies to a wide range of food products (fish, meat, dairy and plant products, etc.). As a result, the public-sector costs estimated in this study are likely to be over-estimated, and the quoted ratio of benefits to cost is likely to be an under-estimate.

To provide a more usable set of factors, these findings are expressed as multipliers of the trade values concerned in each commodity group, shown in Table 35. Thus, for example, investment in SPS controls for fishery products (in the first row of the table) of 1.8% of trade value (public sector) and 0.3% (private sector) could be expected to deliver benefits (value added) of 10% of trade value. This provides a more usable tool for estimating overall impacts of different levels of investment

Table 35: CBA SPS+ public costs, private costs and trade benefits multipliers for main commodity groups

Commodity	Public costs	Private costs	Trade Benefits /yr.
	Multiplier % trade	Multiplier % trade	Multiplier % trade
All Fishery products	1.8%	0.3%	10.0%
All Fresh and processed FRUIT & VEGETABLES	2.1%	1.9%	13.1%
All Meat products*	1.7%	2.1%	9.3%

* Poultry with import replacement

9.3 National costs and benefits

The estimated annual regional costs (US\$97 million) and benefits (US\$306 million) of the SPS+ regime may be disaggregated to the 15 CARIFORUM countries by simply applying the above factors to the national trade patterns, thus providing an indication of the national impacts of enhanced SPS measures in each case, which reflects the difference in the trade profile of each country. The results of this exercise are shown in Table 36, which shows the impact on increased exports and reduced imports of poultry and other products of animal origin. Individual country breakdowns are also shown in Annex 6.

Table 36: Regional CARIFORUM CBA

CARIFORUM countries	Baseline trade	SPS+ Public costs	SPS+ Private costs	Total SPS+ Compliance costs	Exports SPS+	Benefits from SPS+ Exports	Baseline Meat (Import-export)	Meat (Import-export) SPS+	Benefits from displaced Poultry imports	Total SPS+ benefits	BC ratio
Dominican Republic	1,528	27	25	52	1,674	146	206	96	19	165	3.19
Guyana	478	2	1	3	487	9	16	8	2	11	3.90
Trinidad and Tobago	340	5	4	9	357	17	115	53	11	28	3.10
Jamaica	300	4	4	8	317	17	84	39	8	25	3.02
Belize	238	4	2	6	259	21	2	1	0	22	3.59
Suriname	119	1	1	2	124	5	32	15	3	8	3.30
Barbados	82	1	1	2	84	1	43	20	4	5	2.62
Bahamas, The	72	3	3	6	79	7	113	53	11	18	3.01
Haiti	56	3	3	5	62	6	91	42	9	15	2.81
Saint Lucia	36	<1	<1	<1	37	1	0	-	-	1	3.31
Saint Vincent and the Grenadines	30	1	1	1	32	3	15	7	1	4	2.97
Grenada	25	1	1	1	27	2	14	6	1	3	3.10
Dominica	7	<1	<1	1	8	1	8	4	1	1	2.77
Kitts and Nevis	4	<1	<1	<1	4	-	8	4	1	1	2.46
Antigua and Barbuda	3	<1	<1	1	3	0	20	9	2	2	2.50
Total	3,316	52	46	97	3,553	237	767	356	71	308	

(US\$ million except BC ratio)

Clearly, countries with greater levels of trade will incur both greater costs and greater benefits in the enhanced SPS scenario than small countries. In this respect the Dominican Republic, which accounts for just under half of the CARIFORUM regional trade, would incur just over half of the costs and receive over half of the benefits of the SPS+ scenario.

It should be noted that the public costs of the SPS+ scenario (US\$52 million/year, Table 36) would be sustained directly by the countries within the region. However, there are some additional efficiency gains to be made if some of the public costs can be made at the regional level. Thus, certain services, such as laboratory testing or inspection services (but not risk management or certification, which are sovereign state functions), could be provided by regional service facilities (rather than reproducing the investment in each country).

The validity of this approach is evident when considering some of the smaller countries with only small levels of export trade, such as Dominica, St. Kitts and Nevis, St. Lucia, Saint Vincent and the Grenadines, Grenada, and Antigua and Barbuda. Here, there are few benefits to a series of relatively small investments, and these countries in particular would benefit from the more efficient SPS services, which could be delivered through regional approaches. Furthermore, it is unlikely that the relatively small investments would be effective anyhow, since there is a minimum dimension of viable service level, which such small trade volumes would be unlikely to sustain.

Until now, only preliminary steps have been taken at the regional SPS level and this study provides a clear economic argument for greater investment in regional facilities, which will particularly benefit the smaller trading members of CARIFORUM.

10 CONCLUSIONS AND RECOMMENDATIONS

10.1 Conclusions

Whilst dwarfed by tourism in terms of revenues, the agricultural and fisheries sectors of CARIFORUM countries provide livelihoods to sustain at least 8 million dependent people in the region, as estimated by FAO⁶⁷. All countries in the CARIFORUM have control systems in place that seek to attain a good status of the food safety and agriculture sectors. These sectors, represented by mostly small and medium sized operators, also seek to produce safe and wholesome products. However, the effectiveness of these systems is limited; in some cases, controls are only applied in certain sectors, or to certain markets (such as the EU), whilst products are consigned to other markets (including domestic and tourism) and often imported, without effective application of controls. It is also important to recognise that SPS requirements are not static. Not only do SPS hazards vary over time (with climate change, mutation, changing trade patterns), but the means applied to their official control also evolve (for example in terms of changing regulatory requirements of export markets, such as the introduction of the US Food Safety Modernisation Act).

The result of these gaps is that non-compliant products are exported from the CARIFORUM region, and domestic consumers (including visitors) and farmers are frequently exposed to damaging and uncontrolled threats to their public and agricultural health. This lack of compliance has economic consequences, in terms of opportunity costs in trade (for increased levels of exports and import substitution) and in terms of increased risk of damage to consumer health (health care and lost productivity) and agricultural production systems (introduction and spread of plant and animal diseases).

The study has shown that investments in the upgrading of SPS conditions in the 15 CARIFORUM countries provide clearly positive benefits, well in excess of the costs involved. Increased investment in SPS compliance of US\$97.4 million/year (2.4% of annual food and agricultural export trade value) could be expected to deliver trade benefits of US \$306 million/year (a ratio of benefits to costs of 3.14 to 1). Overall for every US\$1 spent, US\$3.14 of economic benefits are derived. Sustained over a period of 10 years, an expenditure of approximately US\$100 million/year is therefore estimated to generate an additional value added of US\$314 million/year through improved trading conditions. These benefits correspond to a 5% increase in current agricultural value added (US\$6.2 billion in 2014), but a very small increase in current GDP (due to the economic dominance of non-agricultural sectors such as energy, finance, and tourism). The major impacts of enhanced SPS measures would therefore be to sustain the employment of significant numbers of people engaged in the agricultural and fisheries sectors, and their dependents, and to contribute to the food security of the national populations.

In addition to trade benefits, enhanced SPS regimes would be expected to improve the health of national populations, due to improved safety of food and reduced incidence of food borne disease. Here the estimated cost of health care and lost productivity (through death and illness) is estimated at about US\$1.4 billion per year for the region. The billions of hidden export earnings from tourism are substantially dependent on ensuring that safe food continues to be provided to almost 29 million visitors each year. The risk of introduction of damaging plant pests and animal diseases would also be reduced, resulting in less frequent and less damaging outbreaks,

⁶⁷. However, this figure is likely to be an under-estimate, given that populations of the Dominican Republic and Haiti both exceed 10 million.

which can potentially destroy important productive sectors. Here benefits, although not quantifiable, are particularly important in relation to limiting the spread of non-native fruit flies and protecting poultry and emergent aquaculture sectors from disease introduction.

In all cases, the compliance cost burden falls both on public sector and private operators. Whilst the precise share of costs will depend, to an extent, on policy regarding the extent of public support for farmers and other operators in the supply chain, the study suggests that about 55% of the investments will need to be made in public goods and services (SPS control systems, laboratories, and subsidies) and about 45% will need to be made by the private sector (in upgraded supply chain conditions and systems such as HACCP and traceability).

Therefore, even though official SPS control systems may be upgraded (through investment in strengthening capacity of competent authorities, regulations, and laboratories), the limited ability of large numbers of small scale operators to finance the corresponding upgrades along the supply chain, will be likely to limit the outcome in terms of improved sanitary and phytosanitary status of the region.

10.2 Recommendations

The study has shown that investment to strengthen the implementation of SPS measures would be highly cost efficient, both in terms of trade-linked benefits, as well as reducing the frequency of sanitary and phytosanitary mishaps and the severity of their impact on human, plant, and animal health throughout the region. Given the clear benefits of SPS investment, it is therefore recommended that **strengthening of public sector SPS control systems and implementation by agri-food business operators should be strongly supported by national and regional policy measures.**

To ensure that such investments can be undertaken by small and medium sized business operators in the agri-food supply chain, it is further recommended that **financial mechanisms should be developed to support the required private sector investment.** This can include credit lines, but it should also **consider a re-orientation of agricultural and fisheries subsidies from input support (such as seeds, fertiliser, fuel, engines) to grant support for capital investment in SPS-compliant production.**

A pre-condition for such investments is a minimum scale of operations. In the private sector this means that **policy support for the establishment of formally constituted collective organisations** (i.e. with legal personality) should also be included in the support measures. **Phased implementation of SPS measures over time (to recognise limited capacity of the sector to respond) should therefore be coordinated with agricultural policy on subsidies.**

Given that the benefits related to protection of public and agricultural health are considerable, and at least as large as improved trade, it is further recommended that future **efforts to develop SPS controls should not be exclusively focused on meeting export market requirements, but should equally address the safety of imports and national control systems within an integrated SPS management system** (to ensure that domestic consumer health, including that of tourist visitors, and agricultural production are not undermined). **The need for an integrated approach to SPS controls with clearly defined and exclusive mandates should be the primary driver for a recommended consolidation and restructuring of national institutions throughout the region.**

Furthermore, to ensure optimal developmental impacts, **investment should be risk-based, focusing on strengthening official control systems for the most SPS sensitive commodities.** This would apply to those

sectors where employment and livelihoods are most exposed to SPS risks (e.g. domestic poultry), where export benefits can be clearly obtained through improved market penetration (e.g. fruit and vegetable sector), and where current risks are not well controlled (e.g. ciguatera in the fishery sector). Political will is required in all cases, not just to allocate priorities and budgets, but **to ensure that sanctions are applied effectively to ensure that non-compliant national operators cannot supply products to the market.**

SPS investments are not fully scalable, in that there is a certain minimum size below which control systems cannot be viable (for example in terms of laboratory capacity). Many countries within the region have limited agricultural and fisheries production, where the dimensions of the sector cannot justify the minimum level of investments in SPS compliance systems. For such countries, which may include Dominica, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Grenada, and Antigua and Barbuda, there is a clear argument for regionalisation of SPS services. Larger countries can also access the benefits of regionalisation through reduced cost and improved efficiency of controls. **It is therefore recommended that regional bodies make greater efforts to develop regional services to support the SPS activities of the national competent authorities. In this respect, there is a need to determine the precise range of support functions to be provided by regional bodies, and to ensure that there is a coherent provision between the different agencies concerned.**

11 ANNEX 1: REFERENCES

Adesiyun A. et al, 2014. Survey of Salmonella Contamination in Chicken Layer Farms in Three Caribbean Countries (Trinidad and Tobago, Grenada, and St. Lucia). *Journal of food protection* 77(9): 1471-1480.

Angelucci, F. and P. Conforti 2010. Risk management and finance along value chains of Small Island Developing States. Evidence from the Caribbean and the Pacific. *Food Policy* 35 (2010) 565–575

Artecona, R. and R. Grundke, 2011. Effects of the United States food safety and agricultural health standards on agri-food exports from Latin America and the Caribbean. *ECLAC Studies and Perspectives Series*, 11., 38p.

BDS Report to the Caribbean Centre for Competitiveness (CCFC), 89p.

CARICOM. 2016. CARICOM's selected economic indicators 2005. 2010-2014. A statistical profile of the CARICOM single market and economy. 99p.

CIFOG, 2016. Influenza aviaire Avian dans le Gers: du choc de la crise à l'ambition commune d'un avenir sain et durable - influenza in the Gers (County SW France). From the initial crisis choc to a common ambition for a safe and sustainable future (in French). Report 24 June 2016, 16p.

Clinton Beckford, 2012. Issues in Caribbean Food Security: Building Capacity in Local Food Production Systems, Food Production - Approaches, Challenges and Tasks, Prof. Anna Aladjadjiyan (Ed.) <http://cdn.intechopen.com/pdfs-wm/26514.pdf>

CRFM, draft August 2015. Caribbean Fisheries Regional SPS Framework, Proposed Framework for Regional Cooperation on CARIFORUM Standards for Fish and Fishery Product Hygiene, 39p. from http://www.crfm.int/index.php?option=com_k2&view=itemlist&task=tag&tag=sps+project&Itemid=455

CRFM, 2011. Report of the CARICOM/CRFM/JICA First Regional Aquaculture Development Planning Workshop, 14 – 21 March 2011, Kingston, Jamaica. CRFM Technical and Advisory Document – Number 2011/3. 115p.

CRFM. 2015. Terminal Report – CRFM SPS Legislation and Environmental Monitoring Media Coverage. CRFM Administrative Report. 108 p.

CRFM, 2016. Promoting Regional Trade and Agribusiness Development in the Caribbean: Case Studies on Linking Fisheries to Tourism-Related Markets. CRFM Technical and Advisory Document, No 2016 / 3. Belize City. pp101.

CTA, 2014. Brussels Briefing n°37. Building resilience of SIDS through trade and agribusiness development, I. Boto, L. Mofolo and J. Pfund, 47p. from <https://brusselsbriefings.files.wordpress.com/2014/07/reader-bb37-sids-resilience-and-agribusiness-rev1.pdf>

CTA, 2015. 2015 Caribbean Pacific Agri-Food Forum (CPAF 2015), collaborative report, 32p. from http://www.cta.int/images/CTA_CPAF2015Report_final.pdf

CTA and IICA, 2015. Study on Agribusiness Development – Strengthening Agritourism potential in the Caribbean, K. Rhiney ed. 126p.

Day, R.K, Quinlan, M.M. and Ogutu, W.O. (2006). Analysis of the Application of the Phytosanitary Capacity Evaluation Tool. Report to the Secretariat of the International Plant Protection Convention, 117p; from https://www.ippc.int/static/media/files/publications/en/1173096427927_PCE_Assessment_Final_Report_1.pdf

EC, 2010. Consolidated data. Results of border checks carried out by EU Member States and Norway on the imported products listed in Annex I to Regulation (EC) No 669/2009; oc_leg_imports_dpe_ms_border-checks-results_2010.pdf

ECLAC. FAO. IICA. 2015. The Outlook for Agriculture and Rural Development in the Americas: A Perspective on Latin America and the Caribbean: 2015-2016. 211p.

Food and Agriculture International Development, 2012. Business Case for Investments to Strengthen the National Agricultural Health and Food Control System in Barbados, NAHFCS Business Case. Food and Agriculture International Development (FAID) report 168p.

FAO, 2011. Reducing the CARICOM Food Import Bill and the Real Cost of Food: Policy and Investment Options, S.Silva, R.Best and J. Tefft, Report to CARICOM/ CARIFORUM, 75p. from http://agricarib.org/images/docs/CARICOM_Food_Import_Bill.pdf

FAO, 2013. CARICOM Food Import Bill, Food Security and Nutrition. Issue Brief #5, Sub-regional Office for the Caribbean, October 2013, 4p.

FAO. 2014. FAO Statistical yearbook. Latin America and the Caribbean food and agriculture. 197p.

FAO, CTA and IFAD 2015. Youth and agriculture: Key challenges and concrete solutions, 105p.

Felix, M. 2012. Supply Chain, analysis for fresh seafood in Haiti. Final Project paper, University Fisheries Training Programme, 22p.

Gebrehiwet, Y, S. Ngqangweni and JF Kirsten, 2007. Quantifying the trade effect of sanitary and phytosanitary regulations of ECD countries on South African food exports. *Agrekon*, 46(1): 23-39.

Gordon, A. ed., 2015. Food Safety and Quality Systems in Developing countries, Volume 1. Export challenges and implementation strategies. Academic press.

Gordon, A. ed., 2016. Food Safety and Quality Systems in Developing countries, Volume 2. Case Studies of effective implementation. Academic press.

Graham, B. 2012. Profile of the small-scale farming in the Caribbean. Initiative Hunger-Free Latin America and the Caribbean, and FAO. Workshop report, 62p.

Hoffmann. Sandra. Bryan Maculloch. and Michael Batz. 2015. Economic Burden of Major Foodborne Illnesses Acquired in the United States. EIB-140. U.S. Department of Agriculture. Economic Research Service. May 2015. 59p.

Indar-Harrinauth L, et al., 2001. Emergence of *Salmonella enteritidis* phage type 4 in the Caribbean: Case-control study in Trinidad and Tobago, West Indies. *Clin. Infect. Dis.* 32(6): 890-6.

IDB (FSO), 2006. Guyana Agricultural Export Diversification Program, Project Concept Document. Inter-American Development Bank, Fund for Special Operations, 25p. <http://www.iadb.org/en/projects/project-description-title,1303.html?id=GY%2DL1007>

ILO. 2016. What works: Active labour market policies in Latin America and the Caribbean / International Labour Office. Geneva: ILO. 206p.

IPPC, 2012. Regional workshop for the review of phytosanitary surveillance in the context of the IPPC Standard (ISPM 6) - Identification of challenges and best practice in the Caribbean Sub-region, Barbados from https://www.ippc.int/static/media/files/publications/en/1327941229_Final_Report_-_Caribbean_Regiona.pdf

Keenan, S et al, 2015. Food Safety Policy and Regulation in the United States, Study for the European Parliament ENVI Committee. Campden BRI and Milieu Ltd, 52p., from [http://www.europarl.europa.eu/RegData/etudes/STUD/2015/536324/IPOL_STU\(2015\)536324_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/STUD/2015/536324/IPOL_STU(2015)536324_EN.pdf)

Maijala, RL and Nuotio, L. 2000. A cost-benefit analysis of the national Salmonella control programme for egg layers in Finland. Paper of the National Veterinary and Food Research Institute, P.O.Box 368, 00231 Helsinki, Proceedings of the 9th International Symposium on Veterinary Epidemiology and Economics, 2000, from www.sciquest.org.nz

Maskus, K.E., T. Otsuki and J.S. Wilson, 2005. The Cost of Compliance with Product Standards for Firms in Developing Countries: An Econometric Study World Bank, 35p.

OECD, 2007. A review of methods for quantifying the trade effects of standards in the agri-food sector. Trade Policy Working Paper No.79. J. Korinek, M. Melatos and M.-L. Rau, 52p. TAD/TC/CA/ WP(2007)1/FINAL

OECD/WTO (2015), Aid for Trade at a Glance 2015: Reducing Trade Costs for Inclusive, Sustainable Growth, WTO, Geneva/OECD Publishing, Paris.

Saint Kitts and Nevis, 2015. National plan of action to prevent, deter and eliminate Illegal, Unreported and Unregulated (IUU) Fishing. Prepared by the Ministry of Agriculture, Marine Resources and Cooperatives, through its Department of Marine Resources (DMR), in close coordination with all key stakeholders, and with technical guidance from the Food and Agriculture Organization of the United Nations (FAO), 36p. from <http://www.fao.org/3/a-az642e.pdf>

SLBS, 2016. Draft National Code of Practice: Code of Good Agricultural Practices for Broiler production, Saint Lucia Bureau of Standards, 42p. www.slbs.org.lc

Sterling, B. et al, 2015. Assessing the Value and Role of Seafood Traceability from an Entire Value-Chain Perspective. Comprehensive Reviews in Food Science and Food Safety, 14: 205-268.

TEEB, 2014. The economics of ecosystems and biodiversity (TEEB) for Agriculture and Food, Concept Note, February 2014, 20p.

UNCTAD, 2014. Review of Maritime Transport.

USFDA, 2015. Amendments to Registration of Food Facilities. Preliminary Regulatory Impact Analysis. Department of Health and Human Services, Food and Drug Administration. FDA-2002-N-0323, April 2015, 69p.

USDA, 2016. Challenges, opportunities and outlook for trade agreements with the United States: the case of three chains and countries in Latin America and the Caribbean / IICA. – San José, C.R., 46p.

Wallace, M.X. 2015. Value Chain Analysis of the Saint Lucia Broiler Industry. Report submitted to the Caribbean Centre for Competitiveness (CCFC), 89p.

Wilhelms, Julia. 2014, Comparison of European and US Food Law Regulations in the Context of the Transatlantic Trade and Investment Partnership, Munich, GRIN Verlag. Masters' Thesis, University of Bonn.

WTTC, 2016. Travel and Tourism Economic Impact 2015. World Travel and Tourism Council, Caribbean report, 24p.

WUSC, 2016. Promotion of Regional Opportunities for Produce through Enterprises and Linkages (PROPEL). Market Study for Fresh Produce St. Lucia, Grenada, Dominica and St. Vincent and the Grenadines. Commissioned report prepared by Arnold Babwah & Associates, Funded by IDRC, 138p.

12 ANNEX 2: FIELD MISSIONS

Date	Activity /Deadline
02 September 2016	Contract signatures
12 September 2016	Inception briefing (Skype)
10 October 2016	Field mission 1 (Jamaica, Trinidad & Tobago)
22 October 2016	End of field mission 1
14 November 2016	Field Mission 2 (St. Lucia, Barbados, Suriname)
02 December 2016	End of field mission 2
February 2017	Attendance at 10 th EDF SPS Project Closing Symposium
10 March 2017	Contract end

13 ANNEX 3: PERSONS MET

Name	Job Title	Organisation	Country of Business	E-mail Address
Adrian Mac Carthy		Chemistry Food and Drugs Division	Trinidad and Tobago, W.I.	adrian.mccarthy@health.gov.tt
Adrienne Stewart		TTBS	Trinidad and Tobago, W.I.	adrienne.stewart@ttbs.org.tt
Aldwin Wellington		Plant Quarantine Service, Ministry of Agriculture, Land and Fisheries	Trinidad and Tobago, W.I.	plantquarantine.centeno@gov.tt
Allan Balfour		Agricultural Service Division, MALF	Trinidad and Tobago, W.I.	allan_balfour@yahoo.co.uk
André Gordon, PhD	TSL Technical Services Ltd CEO	Technological Solutions Ltd, MD	Jamaica, W.I.	andre.gordon@tsltech.com
Ann-Margaret Adams	Information and Broadcasting	Department of Tourism	Saint Lucia, W.I.	ann-margaret@govt.lv
Arkie Jagroip		MHI	Suriname	arkie1988@hotmail.com
Audhoe Egon	Board Member (logistics airline)	Suriname Chamber of Commerce and Industry CCI - KKF	Suriname	chamber@sr.net
Auria King-Cenac	VLSD	Ministry of Agriculture	Saint Lucia, W.I.	Auria.KingCenac@govt.lc
Ava Marius		Customs and Exercise Department	Saint Lucia, W.I.	amarius@customs.gov.lc
Avis Matthias		Ministry of Industry, Commerce, Agriculture and Fisheries - MICAF	Jamaica, W.I.	amathias@micaf.gov.jm
B. Ramadhin	Chair	Association of Rice Exporters	Suriname	rijkbedrijframadhin@live.com
Benito G. Reeberg	Voorzitter - Chair	Surinam Agricultural Forum for Youth - SURAFY	Suriname	benitoreeberg@gmail.com
Bernice Chase	Agro-tourism and on farm processor	J&P Farms	Barbados, W.I.	bernicechase@gmail.com
Beverley Alleyne	Senior Business Development Officer	Barbados Investment & Development Corporation - BIDC	Barbados, W.I.	balleyne@bidc.org
Beverley Wood, PhD	Project Coordinator	NAHFCA	Barbados, W.I.	wood@nahfcp.gov.bb

Name	Job Title	Organisation	Country of Business	E-mail Address
Brent Theophile	National Technical Specialist	IICA - Delegation in St. Lucia	Saint Lucia, W.I.	brent.theophile@iica.int
Bret Taylor	Plant Health	NAHFCA	Barbados, W.I.	planthealth@nahfcp.gov.bb
C. Abiamof-Menig	Organics	Interior Development Fund (FOB)	Suriname	c.menig@gmail.com
Carleen Joseph		Ministry of Agriculture, Corporate Planning	Saint Lucia, W.I.	economist.agriculture@govt.lc
Carmen van Dyk		LVV-ODLOAV	Suriname	dijkvanmij34@live.com
Carol Thomas	International Agricultural Health and Food Safety Specialist	IICA - Delegation in Barbados	Barbados, W.I.	carol.thomas@iica.int
Carolyn McDonald-Riley	Economist/ Head - Tourism Linkages Hub	Ministry of Tourism & Entertainment - Jamaica Tourism Centre	Jamaica, W.I.	carolyn.riley@mot.gov.jm
Cedric Lazarus, PhD	Livestock Development Officer for the Caribbean	FAO	Virtual	Cedric.Lazarus@fao.org
Charelle Parker	Bureau of Standards	SSB	Suriname	c.parker@ssb.sr
Charline Francis		Blackbay Small Farmers	Saint Lucia, W.I.	blackbayfarmers.coop@gmail.com
Cheryl-Ann Dookie	Export Officer	Export TT	Trinidad and Tobago, W.I.	cdookie@exportt.co.tt
Christian George	Research Officer, trade Unit	Trinidad & Tobago Manufacturers' Association - TTMA	Trinidad and Tobago, W.I.	trade@ttma.com
Curt D. Delice	Representative	IICA - Delegation in Suriname	Suriname	curt.delice@iica.int
Cynthia Lionel	Manager	Agro-Processing Facility	Saint Lucia, W.I.	
David Chung	Quality Assurance Manager	Salada Foods Jamaica Ltd.	Jamaica, W.I.	d.chung@saladafoodsja.com
David W. Dobson	Senior Director, Technical Services	Ministry of Tourism & Entertainment - Jamaica Tourism Centre	Jamaica, W.I.	david.dobson@mot.gov.jm
Deanne Ramroop		Research Division Centeno, MALF	Trinidad and Tobago, W.I.	dramproop@hotmail.com

Name	Job Title	Organisation	Country of Business	E-mail Address
Desmond A. Ali, PhD	Executive Director	Caribbean Poultry Association - CPA	Trinidad and Tobago, W.I.	desmondali@caribbeanpoultry.org
Desmond A. King		Ministry of Health	Barbados, W.I.	Desmond.king@health.gov.bb
Devi Yanrataso		Seafood Industry Development Company Ltd	Trinidad and Tobago, W.I.	dryanRataso@sidctt.com
Dino Demidof	Technical Specialist	IICA - Delegation in Suriname	Suriname	dino.demidof@iica.int
Donna Lewis		Bureau of Standards Jamaica - BSJ	Jamaica, W.I.	dlewis@bsj.org.jm
Dunstan Demille	Perishables Manager	Massy Stores LTD	Saint Lucia, W.I.	Dunstan.Demille@Massygroup.com
Eden Compton		Ministry of Agriculture	Saint Lucia, W.I.	specialagri.projects@govt.lc
Edric Harry		IICA	Trinidad and Tobago, W.I.	edric.harry@iica.int
Elizabeth S Johnson, PhD	Representative	IICA - Delegation in Jamaica	Jamaica, W.I.	shauna.brandon@iica.int
Ena Harvey	Representative	IICA - Delegation in Barbados	Barbados, W.I.	Ena.Harvey@iica.int
Eric Bogers		Orange Horizon, Consultant Agri-food FS	Trinidad and Tobago, W.I.	ericbogers@hotmail.com
Ernie Pierre		Ministry of Health	Saint Lucia, W.I.	erniePierre@Hotmail.com
Farida Mentowidjojo	Head Inspection Services	VKI - Competent Authority Fishery and Aquaculture	Suriname	viskeurigsinstitut@gmail.com
Farz Khan		Food and Drugs Inspector	Trinidad and Tobago, W.I.	farz.Khan@health.gov.tt
Fitzroy White		MICAF Plant Quarantine	Jamaica, W.I.	fswhite@micaf.gov.jm
G. André Kong		MICAF Fisheries Division	Jamaica, W.I.	gaKong@micaf.gov.jm
Gabriel Brown		UWI - SVM	Trinidad and Tobago, W.I.	gabriel.browm@sta.uwi.edu
Gasper George		Trade Export Promotion Agency (TEPA)	Saint Lucia, W.I.	ggeorge@tepa.org.lc
Gerard van den Bergh	Owner	Duck Farm	Suriname	
Gideon Ramtahal		Cocoa Research Centre - UWI	Trinidad and Tobago, W.I.	gideonramtahal@gmail.com

Name	Job Title	Organisation	Country of Business	E-mail Address
Gillian Goddard		ARC TT	Trinidad and Tobago, W.I.	gilliangoddard@yahoo.com
Gillian Taylor Ellis		MICAF-VSD Veterinary Services	Jamaica, W.I.	gaellis@micaf.gov.jm
Glenmilton Cruickshank	Acting Head of the Suriname Customs and Excise	Douane Suriname	Suriname	kevasmat@yahoo.com
Gregg, C.E. Rawlins	Representative	IICA - Delegation in Trinidad and Tobago	Trinidad and Tobago, W.I.	gregg.rawlins@iica.int
H. Egbert Lansiquot		MS. St. Rise Creole Delight	Saint Lucia, W.I.	Myrose.creolelight@gmail.com
Haidy Tawjoeram	Fishing Company	SAIL	Suriname	h.tawjoeram@sailsuriname.com
Harnarine Lalla		Fisheries Division - Aquaculture	Trinidad and Tobago, W.I.	h_lalla@hotmail.com
Hilary George	Research and Development Division	Ministry of Agriculture	Saint Lucia, W.I.	HLGGeorge@yahoo.com
Hr. P. Lank, BSc	Director	Suriname American Industries Ltd. (SAIL N.V.)	Suriname	sail@sr.net
Imnah Alexander		Bellevue Farmers Cooperative	Saint Lucia, W.I.	
Isaac Maurice		Grace Farmers Group	Saint Lucia, W.I.	
J. Roopram	Proprietor	Roti Restaurant	Suriname	jainananroopram@hotmail.com
James Paul		Barbados Agricultural Society	Barbados, W.I.	
Janet Lawrence, PhD	SPS Project Manager	IICA - Delegation in Barbados	Barbados, W.I.	janet.lawrence@iica.int
Jerson Badal		St Lucia Fish Marketing Corporation	Saint Lucia, W.I.	jerson.badal@gmail.com
Joan Lewis		Agricultural Planning Division, MALF	Trinidad and Tobago, W.I.	joanlewis95@gmail.com
Jo-Anne Beharry		TTBS	Trinidad and Tobago, W.I.	joanne.beharry@ttbs.org.tt
Joyce Leslie	Fisheries Division	Ministry of Agriculture	Barbados, W.I.	dcfo@agriculture.gov.bb
Juliette Colli Wongsoredjo	Director	VKI - Competent Authority Fishery and Aquaculture	Suriname	

Name	Job Title	Organisation	Country of Business	E-mail Address
Kanita Y. Tomlinson		The TBL	Jamaica, W.I.	ktomlinson@tradeboard.gov.jm
Karla George		UWI - SVM	Trinidad and Tobago, W.I.	karla.george@sta.uwi.edu
Kenny Daniel	KLO Koko	KAMCS Ltd	Saint Lucia, W.I.	dlokoko205@gmail.com
Kishore Ragbir		Plant Pathology Unit, Ministry of Agriculture, Land and Fisheries	Trinidad and Tobago, W.I.	kishoreragbir@yahoo.com
L. Simeon Collins	Chief Executive Officer, B.Sc.; M.Sc.	CAHfSA - Caribbean Agricultural Health and Food Safety Agency	Suriname	cahfsa14@gmail.com
Ledewijk Heidanus	Fishing Company	SAIL	Suriname	heidanus@sr.net
Leon Jordan		Government Analytical Services	Barbados, W.I.	inorganics@gas.gov.bb
Lindsay Gay		TTGSS	Trinidad and Tobago, W.I.	lindsaygay21@yahoo.com
Lisa Benjamin		Independent Consultant. Epidemiology Honeybees	Trinidad and Tobago, W.I.	lisbenj@gmail.com
Lloyd Kühn		Douane Suriname	Suriname	lrkuhn@hotmail.com
Magubane Poetisi	Bureau of Standards	SBF	Suriname	mpoetisie@bbc.sr
Marc Sandy	Team Lead, Business Development Unit	Trinidad & Tobago Manufacturers' Association - TTMA	Trinidad and Tobago, W.I.	research@ttma.com
Marcia Wright-Thomas		Jamaica Bureau of Standards - Industrial Training Unit	Jamaica, W.I.	
Marguerite Asson		Grace Farmers Group	Saint Lucia, W.I.	
Marion Lewis		Ministry of Planning and Development	Trinidad and Tobago, W.I.	marion.lewis@plannign.gov.tt
Mark Trotman	Veterinary Services	Ministry of Agriculture	Barbados, W.I.	mtrotman@agriculture.gov.bb
Matthew Roopsingh		MAFAS Ltd.	Trinidad and Tobago, W.I.	roopsinghmatthew@yahoo.com
Mavis Sabajo	Representative Secretary	IICA - Delegation in Suriname	Suriname	mavis.sabajo@iica.int

Name	Job Title	Organisation	Country of Business	E-mail Address
Michel Karsuredjo		Douane Suriname	Jamaica, W.I.	mkarsoredjo@gmail.com
Michelle Parkins		Ministry of Industry, Commerce, Agriculture, and Fisheries - MICAF	Jamaica, W.I.	mparkins@micaf.goc.jm
Nacia Calderon		Bellevue Farmers Cooperative	Saint Lucia, W.I.	bellevuecoop@gmail.com
Neela Badrie, PhD	Professor, Food Microbiology and Safety	The University of the West Indies - UWI, Department Food Production	Trinidad and Tobago, W.I.	NeelaBadrie@sta.uwi.edu
Neil Rampersad		Public Health Inspectorate	Trinidad and Tobago, W.I.	slikneils05@yahoo.com
Nerissa Lucky		Fisheries Division	Trinidad and Tobago, W.I.	nerissalucky@gmail.com
Path Umaharan		Cocoa Research Centre - UWI, Director	Trinidad and Tobago, W.I.	pathmanathan.umaharan@sta.uwi.edu
Patricia Anthia Johsua	Agri-enterprise development	Ministry of Agriculture	Saint Lucia, W.I.	anthia.joshua@govt?lc
Patsy E. Duncan	Managing Director	Tropical Foods Dist. Ltd, Exporter of Fresh produce	Jamaica, W.I.	tropicalfoods@hotmail.com
Petal Ram		Horticultural Services Division, MALF	Trinidad and Tobago, W.I.	petalram@gmail.com
Peter Fostin	Marketing Manager	Bellevue Farmers Cooperative	Saint Lucia, W.I.	RaphaelFullie1550@hotmail.com
Petra Auguste		Divine Orchards Inc.	Saint Lucia, W.I.	kidscare.petra@gmail.com
Petrina Mokool-Mohammed	Researcher, Food Technology Unit	Caribbean Industrial Research Institute - CARIRI, Caribbean Food Safety Centre - CFSC	Trinidad and Tobago, W.I.	pmokool@cariri.com
Prematee Ramnarine		Network of Rural Women Producers	Trinidad and Tobago, W.I.	nrvptt@gmail.com
Prija Soechitram	Managing Director	International Trade and Match making Unit at the CCI - CABU (South America)	Suriname	info@cabu.sr
R. Nojodimedjo	LVV	Ministry of Agriculture	Suriname	raymon.nojodimedjo@yahoo.com
Ramgopaul Roop	Regional Administrator	Caribbean Agribusiness Association, CABA	Trinidad and Tobago, W.I.	cabasecretariat@gmail.com

Name	Job Title	Organisation	Country of Business	E-mail Address
Randel Esnard	Agri-enterprise development	Ministry of Agriculture	Saint Lucia, W.I.	randel.esnard@gmail.com
Raphael Fulia	General Manager	Bellevue Farmers Cooperative	Saint Lucia, W.I.	RaphaelFullie1550@hotmail.com
Ratan Kalka	Manager, Business Support Services	Suriname Business Development Center	Suriname	rkalka@sbc.sr
Recardo Mieux		Fisheries Division	Trinidad and Tobago, W.I.	rmieux@gov.tt
Reina Raveles, Msc	Permanent Secretary	Ministry of Trade and Industry	Suriname	reina.raveles@minhi.gov.sr
Rianne Edmond		Seafood Industry Development Company Ltd	Trinidad and Tobago, W.I.	redmond@sidctt.com
Richard Matthias		Mille Fleurs Honey Producers Coop., Belle Ruches Apiaries	Jamaica, W.I.	Matthias.Richard@yahoo.com
Richard Brown, PhD		Ministry of Industry and Commerce, Agriculture and Fisheries (MICAF)	Saint Lucia, W.I.	rbrown@micaf.gov.jm
Richard Trotman	Managing Director	House of Arendel, Trinidad Chocolate Factory Ltd	Trinidad and Tobago, W.I.	richard@arendel.com
Rohanie Marharaj, PhD	Associate Professor Food Science and Technology	University of Trinidad and Tobago - ECIAF	Trinidad and Tobago, W.I.	rohanie.maharaj@utt.edu.tt
Ronald Ramjattan	CEO	Baron Foods	Saint Lucia, W.I.	rranjattan@baronfoodsltd.com
Rosina Maitland	Animal Health	NAHFPC	Barbados, W.I.	animalhealth@nahfcp.gov.bb
Sadhana Jankie	LVV	Ministry of Agriculture	Suriname	sadjan349@yahoo.com
Sam Bissessar		Veterinary Public Health, Ministry of Health	Trinidad and Tobago, W.I.	arkle66@hotmail.com
Sandra Greenidge		Network of Rural Women Producers	Trinidad and Tobago, W.I.	
Sanniel Wilson		MICAF Plant Quarantine	Jamaica, W.I.	sswilson@micaf.gov.jm
Saskia Nahar		MTJ	Suriname	saskia.nahar@minhi.gov.sr

Name	Job Title	Organisation	Country of Business	E-mail Address
Selene Shari Warren		Animal Production and Health / Veterinary Services	Trinidad and Tobago, W.I.	ss_warren@hotmail.com
Seon D. Ferrari		Department of Fisheries	Saint Lucia, W.I.	seon.ferrari@govt.lc
Sharon Jones	Plant Pathologist, project Coordinator	Caribbean Agricultural Research and Development Institute - CARDI	Trinidad and Tobago, W.I.	sjones@cardi.org
Shuah Canchen		Blackbay Small Farmers	Saint Lucia, W.I.	
Simone Martin-Shaw		MICAF-VSD Veterinary Services	Jamaica, W.I.	vsd@micaf.gov.jm
Sinfran Zaandem		SHATA	Suriname	
Soenita Rosan	LVV	Ministry of Agriculture	Suriname	rosannasoen@yahoo.com
Sonia Morgan	Director	Jamaica Bureau of Standards - Industrial Training Unit	Jamaica, W.I.	
Susan Singh-Renton, PhD	Deputy Executive Director	CRFM Secretariat - Eastern Caribbean Office	St. Vincent & the Grenadines	ssinghrenton@vincysurf.com
Tamara Gentles	Receptionist, Secretary	IICA - Delegation in Jamaica	Jamaica, W.I.	tamara.gentles@iica.int
Tamara Morrison		MICAF FSPID	Jamaica, W.I.	tamara.morrison@fspid.gov.jm
Tara Evans-Rose		MICAF ADSC - Anti-dumping	Jamaica, W.I.	tevans@jadsc.gov.jm
Teola Noel		UWI - SVM	Trinidad and Tobago, W.I.	n_teola@yahoo.com
Trumel Redmond	Technical Officer - Conformity Assessment	CROSQ	Barbados, W.I.	trumel.redmond@crosq.org
U. Taus	Agricultural Exporters	UEAPS/Unifood	Suriname	calumartaus@gmail.com
Udo Karg	Sea Food Association	SUVVER	Suriname	
Vandanna Devi Singh-Bogers		Nestlé Trinidad and Tobago Ltd	Trinidad and Tobago, W.I.	Vandanna.singhbogers@tt.nestle.com
Vivian Marbach, BSc	Deputy Director Industry	Ministry of Trade and Industry	Suriname	vivian.marbach@minhi.gov.sr

Name	Job Title	Organisation	Country of Business	E-mail Address
Wayne Marius	Food buyer	Coco Resorts	Saint Lucia, W.I.	costcontroller@coco.resorts.com
Wilgo Bilderdijk	Voorzitter - Chair	Associatie van Surinaamse Fabrikanten - ASFA	Suriname	billy@sr.net
Wynelle Savory		Planning Unit	Barbados, W.I.	wynellesavory@hotmail.com
Yvonne I. Ramnarain, MSc	Acting Deputy Director, Agricultural Research, Marketing and Processing Dept.	Ministry of Animal Husbandry and Fisheries, Production of Food of non-animal origin, LVV	Suriname	ramnarainyvonne@gmail.com

14 ANNEX 4: SPS SYSTEM EVALUATION TOOLS

Performance of Veterinary Services (PVS)

For evaluation purposes, the World Animal Health Organisation (OIE) has defined four essential components of a veterinary control system:

- Technical capability to address current and new issues on the basis on scientific principles;
- Human and financial capital to attract resources and retain professionals having technical and leadership skills;
- Sustained interaction with the private sector to stay on course and carry out relevant joint programs and services, and
- Access to markets through compliance with existing standards and implementation of new disciplines, such as the harmonisation of standards, equivalence agreements and regionalisation.

These four components are reflected in the structure of the PVS tool (see Annex 4 Table 1), which is used to assess the performance, develop a shared vision, establish priorities, and facilitate strategic planning according to a series of critical competencies in each area.

The application of the PVS tool entails a comprehensive review of the veterinary services of the country by a team of experts with a substantial experience of national and international animal health controls. The process requires the participating state to undertake a preparatory descriptive study of the control system, and to support the expert team with logistics. The PVS report is confidential to the OIE and the state, although it may be published with the country's permission. For developing countries, the cost of the PVS is borne by the OIE. The design of the tool can reflect specific requirements in relation to competencies in relation to the Terrestrial Animal Health Code (Terrestrial Code) or the Aquatic Animal Health Code (Aquatic Code).

The PVS is a diagnostic tool only. To determine subsequent steps, for example to design measures to address any gaps or deficiencies identified, the PVS may be followed up with a further exercise, a Gap Analysis which is readily transposed into a plan of actions and costs for capacity building. More details can be obtained from the OIE website⁶⁸.

⁶⁸ <http://www.oie.int/support-to-oie-members/pvs-evaluations/oie-pvs-tool/>

Annex 4 Table 1: Components of the PVS evaluation

Title	Description	Critical competencies
Human, Physical and Financial Resources	Institutional and financial sustainability as evidenced by the level of professional, technical, physical and financial resources available.	Professional and technical staffing of the Veterinary Services Competencies of veterinarians and veterinary para-professionals Continuing education Technical independence Stability of structures and sustainability of policies Coordination capability of the Veterinary Services Physical resources Operational funding Emergency funding Capital investment Management of resources and operations
Technical Authority and Capability	The authority and capability of the VS to develop and apply sanitary measures and science-based procedures supporting those measures.	Veterinary laboratory diagnosis Laboratory quality assurance Risk analysis Quarantine and border security Epidemiological surveillance and early detection Emergency response Disease prevention, control and eradication Food safety Veterinary medicines and biologicals Residue testing Animal feed safety Identification and traceability Animal welfare
Interaction with Interested Parties	The capability of the VS to collaborate with and involve interested parties in the implementation of programmes and activities.	Consultation with interested parties Official representation Accreditation/authorisation/delegation Veterinary Statutory Body Participation of producers and other interested parties in joint programmes
Access to Markets	The authority and capability of the VS to provide support in order to access, expand and retain regional and international markets for animals and animal products.	Preparation of legislation and regulations Implementation of legislation and regulations and compliance thereof International harmonisation International certification Equivalence and other types of sanitary agreements Transparency Zoning Compartmentalisation

Source: OIE Tool for the Evaluation of Performance of Veterinary Services, Sixth Edition, 2013, World Organisation for Animal Health, 2013

[Phytosanitary Capacity Evaluation](#)

The Phytosanitary Capacity Evaluation (PCE) is a tool designed by the International Plant Protection Convention (IPPC) to help a country to identify both strengths and weaknesses in its existing and planned phytosanitary systems.

According to the Food and Agricultural Organization of the United Nations (FAO): *"The PCE generates a snapshot of a country's phytosanitary capacity at a particular time, and provides a framework for rational strategic planning. The PCE allows for the prioritization of activities/resources to fill capacity gaps and enhance the effectiveness of the overall phytosanitary system. Strategic plans developed through the PCE also provides the basis for dialogue with donors of development aid and thus improve the likelihood of access to further funding."*

Unlike the PVS tool for animal health, which is an external peer review, the PCE process is implemented by and under the control of the country being evaluated. The process is implemented through a consensus driven and confidential process amongst concerned stakeholders (public and private) to identify the strengths and weaknesses of the phytosanitary system. The PCE contains strategic planning tools that guide users to develop a strategic framework consisting of logical frameworks for each module which together are used to develop a national phytosanitary action plan (NPAP). For this reason, an important part of the process is the training and capacity building of the national stakeholders in the implementation of the tool.

The PCE is a modular online software system consisting of 13 semi structured questionnaire type modules that can be selected and applied in total or in clusters according to the preferences of the National Plant Protection Organizations (NPPO). The process is initiated by a request generated to the IPPC by the NPPO.

The results are intended to be used by NPPOs, and more broadly by government agencies, as a basis to identify capacity building or infrastructure needs and actions to address them. These are not publicly released unless a country wishes to use or present their PCE results externally. The PCE has been designed to be implemented over a number of weeks. The IPPC recommends that a complete PCE be applied every 3-4 years.

The PCE process incurs costs, in training of the staff and technical assistance and guidance provided by the IPPC (and FAO as its secretariat). Some countries are able to finance the process from their budget. Otherwise, donors may also finance the application of the PCE. FAO Technical Cooperation Programme (TCP) Facility funds may be used to perform a PCE and formulate a project on the basis of the results.

According to the IPPC website, the PCE process has been applied in all 15 countries of the CARIFORUM region.

[FAO draft Tool for the Assessment of National Food Control Systems](#)

The FAO has prepared an equivalent evaluation tool to PCE and PVS for the area of food safety (see Annex 4 Figure 1). This was designed in 2013 and subsequently revised. The tool is based on Codex principles and guidelines for National Food Control Systems (CAC/GL 82-2013). The World Health Organization (WHO) also participated in this endeavour by jointly developing aspects relating to surveillance of Food Borne Diseases and strengthening of public health. A first draft of this tool was pilot tested in 2014/2015 in three countries, Zambia, Morocco, and the Gambia. Results from these trials informed the amendment of that first draft into a revised version, which was applied in Sierra Leone in 2015, in an initiative co-funded by FAO and the Standard and Trade Facility (STDF).

The approach applied by the tool is to analyse the system dynamics of the national food control system (inputs, processes, and outputs) with a further evaluation of the capacity of the system to evolve in response to emerging food safety threats. The tool is structured around 4 dimensions (as shown below).

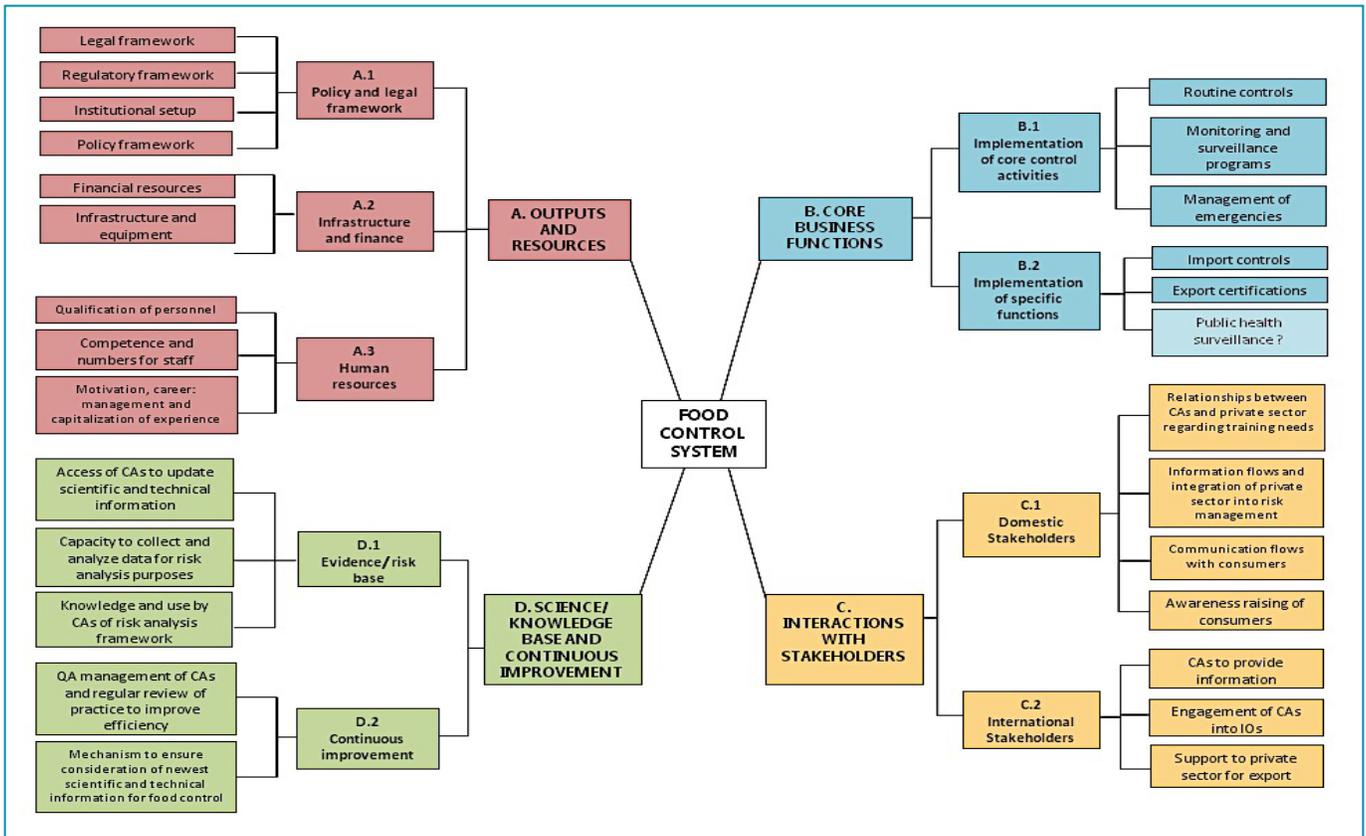
- **Inputs and Resources;** fundamental elements (of a human, financial, infrastructure and policy nature) that are necessary for the system to operate. These are further structured as three sub-dimensions:
 - Policy and Legal Framework,
 - Infrastructure and Finance,
 - Human resources.
- **Core 'Business' Functions;** control functions to be exercised by CAs to ensure food safety along the food chain and to appropriately manage food safety hazards, emerging risks and food emergencies (i.e. processes and food safety outputs); structured under the following sub-dimensions:
 - Implementation of Core Business functions and
 - Implementation of specific functions
- **Interactions with Stakeholders;** interactions that must take place for the system to continuously adjust to stakeholders (both national and international) evolving needs, inspire their confidence and keep them well informed about their responsibilities; structured under two sub-dimensions:
 - Domestic stakeholders
 - International stakeholders
- **Science/Evidence base and Continuous Improvement;** necessary for the system to build its scientific soundness and to keep abreast of new scientific developments and innovations to continuously improve; structured under two sub-dimensions:
 - Evidence/risk base and
 - Continuous improvement

The assessment itself is anchored around 27 competencies that are ordered under the above dimensions. For each competency, the evaluator provides a score. The proficiency level of CAs for each competency is assessed against 10 criteria in average. In total, there are 399 different assessment criteria. For each assessment criterion, three 'status' options are available:

- Not achieved, carrying a weight of '0'
- Partially achieved, carrying a weight of '1'
- Achieved, carrying a weight of '4'.

The total weight achieved for each competency is computed to determine the overall competency score, expressed as a percentage of the actual achievement versus full achievement. It should be noted that scores are only established to facilitate a quick review of major areas of weaknesses and strengths and to follow changes and monitor progress overtime. In absolute terms, they have no significance (for example they should not be used to compare countries). The most important element is the analysis supporting the allocation of scores and status, as this is what allows an understanding of the measures that should be implemented to strengthen the food safety control system.

Until now, the FAO Food Safety Assessment Tool has not been formally adopted. When it is, it will be available for use by states, subject to the same conditions applied to PVS and PCE Tools (to be applied via the FAO, and data confidentiality limited to the state in question).



Source: Assessment of Sierra Leone Food Control System, Dr Oumou Barry, Veterinarian international consultant, UN-Food and Agriculture Organisation

Annex 4 Figure 1: FAO Food Safety Evaluation tool: dimensions, sub-dimensions and competencies

ANNEX 5: DETAILED COST BENEFIT ANALYSES

A 5.1 Trade in Fisheries products

Costs and Trade Benefits over 10 years (US\$ thousand)

Costs and Benefits (US\$ thousand)	YEAR										
	1	2	3	4	5	6	7	8	9	10	TOTAL
Without project											
Export value without project	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	300,000
Export value with SPS+ project	33,000	33,000	33,000	33,000	33,000	33,000	33,000	33,000	33,000	33,000	330,000
Change in export value (factor)	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	
Trade benefits	3,000	30,000									

Public sector Investment and Operating Costs	YEAR 1	2	3	4	5	6	7	8	9	10	TOTAL
Systems upgrade	90	15	15	15	15	90	15	15	15	15	300
Competent Authority Offices, vehicles and equipment	375	375	-	-	-	-	-	-	-	-	750
Operational costs on upgraded facilities (15%)	56	113	113	113	113	113	113	113	113	113	1,069
Laboratory facilities and equipment	500	500	-	-	-	-	-	-	-	-	1,000
Operating costs on upgraded facilities (25%)	125	250	250	250	250	250	250	250	250	250	2,375
Total Public sector costs (US\$ thousand)	1,146	1,253	378	378	378	453	378	378	378	378	5,494
Upgraded factories	250	-	-	-	-	-	-	-	-	-	250
Upgraded packing / landing facilities	100	-	-	-	-	-	-	-	-	-	100
Upgraded vessels / farms	110	-	-	-	-	-	-	-	-	-	110
Operating costs on upgraded infrastructure (10%)	46	46	46	46	46	46	46	46	46	46	460
Total Private sector costs (US\$ thousand)	506	46	46	46	46	46	46	46	46	46	920
SPS Compliance costs (public + private)	1,652	1,299	424	424	424	499	424	424	424	424	6,414

A 5.2 Trade in Canned Ackee

Costs and Trade Benefits over 10 years (US\$ thousand)

Benefits (US\$ thousand)	YEAR 1	2	3	4	5	6	7	8	9	10	TOTAL
Quantities exported without project (tonnes)	2,067	2,067	2,067	2,067	2,067	2,067	2,067	2,067	2,067	2,067	20,670
Export value without project	13,779	13,779	13,779	13,779	13,779	13,779	13,779	13,779	13,779	13,779	137,790
Export value with SPS+ project	13,779	14,152	14,535	14,929	15,334	15,749	16,176	16,614	17,064	17,527	155,859
Change in export value (factor)	-	-	-	-	-	-	-	-	-	-	-
Trade benefit	-	373	756	1,150	1,555	1,970	2,397	2,835	3,285	3,748	18,069

Public sector Costs (US\$ thousand)	YEAR 1	2	3	4	5	6	7	8	9	10	TOTAL
Systems upgrade	40	10	10	10	10	40	10	10	10	10	160
Offices, vehicles and equipment	383	383	-	-	-	-	-	-	-	-	765
Operational costs on upgraded facilities (15%)	56	113	113	113	113	113	113	113	113	113	1,069
Laboratory facilities and equipment	20	20	-	-	-	-	-	-	-	-	40
Operational costs on upgraded facilities (25%)	5	10	10	10	10	10	10	10	10	10	95
Training, extension, research communication	75	75	75	75	75	75	75	75	75	75	750
Total Public sector costs (US\$ thousand)	579	610	208	208	208	238	208	208	208	208	2,879

Private sector Costs (US\$ thousand)	YEAR 1	2	3	4	5	6	7	8	9	10	TOTAL
Upgraded factories	1,140	-	-	-	-	-	-	-	-	-	1,140
Upgraded packing / landing facilities	143	-	-	-	-	-	-	-	-	-	143
Upgraded vessels / farms	-	-	-	-	-	-	-	-	-	-	-
Operational costs on upgraded infrastructure (10%)	128	128	128	128	128	128	128	128	128	128	1,283
Total Private sector costs (US\$ thousand)	1,411	128	2,565								
SPS Compliance costs (public + private)	1,990	738	336	336	336	366	336	336	336	336	5,444

ANNEX 6: COSTS AND BENEFITS OF ENHANCED SPS+ MEASURES FOR CARIFORUM COUNTRIES

Antigua and Barbuda	Export* US\$ million	Trade US\$	Public costs	Private costs	Total Compliance costs	*Trade SPS+ US\$	Trade Benefits	BC ratio	Costs/ yr	Benefits /yr	% trade	% trade
All Fishery products	0	3	0	0	0.1	3	0	4.68	0.01	0.03	1.8%	0.3%
All Fresh and processed fruit & veg.	1	13	0	0	0.5	14	2	3.32	0.05	0.16	2.1%	1.9%
Others: Beverage, Cereals and Sugars	1	11	-	-	-	11	-	-	-	-	-	-
Live animals and Plants	0	0	-	-	-	0	-	-	-	-	-	-
Total Exports	3	27				29	2					
All Meat products (imports- exports)*	20	199	3	4	7.6	92	18	2.43	0.76	1.85	1.7%	2.1%
Total costs and benefits			4	4	8		20	2.50	1	2		

Bahamas	Export* US\$ million	Trade US\$	Public costs	Private costs	Total Compliance costs	*Trade SPS+ US\$	Trade Benefits	BC ratio	Costs/ yr	Benefits /yr	% trade	% trade
All Fishery products	70	697	13	2	14.9	767	70	4.68	1.49	6.97	1.8%	0.3%
All Fresh and processed fruit & veg.	0	4	0	0	0.1	4	0	3.32	0.01	0.05	2.1%	1.9%
Others: Beverage, Cereals and Sugars	2	18	-	-	-	18	-	-	-	-	-	-
Live animals and Plants	0	0	-	-	-	0	-	-	-	-	-	-
Total Exports	72	718				789	70					
All Meat products (imports- exports)*	113	1,131	19	24	43.2	525	105	2.43	4.32	10.51	1.7%	2.1%
Total costs and benefits			32	26	58		175	3.01	6	18		

Barbados	Export* US\$ million	Trade US\$	Public costs	Private costs	Total Compliance costs	*Trade SPS+ US\$	Trade Benefits	BC ratio	Costs/ yr	Benefits /yr	% trade	% trade
All Fishery products	0	3	0	0	0.1	3	0	4.68	0.01	0.03	1.8%	0.3%
All Fresh and processed fruit & veg.	10	105	2	2	4.1	119	14	3.32	0.41	1.38	2.1%	1.9%
Others: Beverage, Cereals and Sugars	71	706	-	-	-	706	-	-	-	-	-	-
Live animals and Plants	1	9	-	-	-	9	-	-	-	-	-	-
Total Exports	82	823				837	14					
All Meat products (imports-exports)*	43	428	7	9	16.4	199	40	2.43	1.64	3.98	1.7%	2.1%
Total costs and benefits			10	11	21		54	2.62	2	5		

Belize	Export* US\$ million	Trade US\$	Public costs	Private costs	Total Compliance costs	*Trade SPS+ US\$	Trade Benefits	BC ratio	Costs/ yr	Benefits /yr	% trade	% trade
All Fishery products	57	573	10	2	12.2	630	57	4.68	1.22	5.73	1.8%	0.3%
All Fresh and processed fruit & veg.	119	1,193	25	22	47.1	1,350	156	3.32	4.71	15.65	2.1%	1.9%
Others: Beverage, Cereals and Sugars	61	607	-	-	-	607	-	-	-	-	-	-
Live animals and Plants	0	2	-	-	-	2	-	-	-	-	-	-
Total Exports	238	2,375				2,589	214					
All Meat products (imports-exports)*	2	19	0	0	0.7	9	2	2.43	0.07	0.17	1.7%	2.1%
Total costs and benefits			36	24	60		215	3.59	6	22		

ANNEX 6: COSTS AND BENEFITS OF ENHANCED SPS+ MEASURES FOR CARIFORUM COUNTRIES (CONTINUED)

Dominica	Export* US\$ million	Trade US\$	Public costs	Private costs	Total Compliance costs	*Trade SPS+ US\$	Trade Benefits	BC ratio	Costs/yr	Benefits /yr	% trade	% trade	% trade
All Fishery products	0	0	0	0	0.0	0	0	4.68	0.00	0.00	1.8%	0.3%	10%
All Fresh and processed fruit & veg.	5	46	1	1	1.8	52	6	3.32	0.18	0.60	2.1%	1.9%	13%
Others: Beverage, Cereals and Sugars	2	22	-	-	-	22	-	-	-	-	-	-	-
Live animals and Plants	0	0	-	-	-	0	-	-	-	-	-	-	-
Total Exports	7	69				75	6						
All Meat products (imports-exports)*	8	77	1	2	2.9	36	7	2.43	0.29	0.72	1.7%	2.1%	9%
Total costs and benefits			2	2	5		13	2.77	0	1			

Dominican Republic	Export* US\$ million	Trade US\$	Public costs	Private costs	Total Compliance costs	*Trade SPS+ US\$	Trade Benefits	BC ratio	Costs/yr	Benefits /yr	% trade	% trade	% trade
All Fishery products	14	136	2	0	2.9	150	14	4.68	0.29	1.36	1.8%	0.3%	10%
All Fresh and processed fruit & veg.	1,103	11,029	230	205	435.7	12,476	1,446	3.32	43.57	144.63	2.1%	1.9%	13%
Others: Beverage, Cereals and Sugars	388	3,881	-	-	-	3,881	-	-	-	-	-	-	-
Live animals and Plants	23	232	-	-	-	232	-	-	-	-	-	-	-
Total Exports	1,528	15,278				16,738	1,460						
All Meat products (imports-exports)*	206	2,057	35	43	78.7	956	191	2.43	7.87	19.11	1.7%	2.1%	9%
Total costs and benefits			268	249	517		1,651	3.19	52	165			

ANNEX 6: COSTS AND BENEFITS OF ENHANCED SPS+ MEASURES FOR CARIFORUM COUNTRIES (CONTINUED)

Grenada	Export* US\$ million	Trade US\$	Public costs	Private costs	Total Compliance costs	*Trade SPS+ US\$	Trade Benefits	BC ratio	Costs/yr	Benefits /yr	% trade	% trade	% trade
All Fishery products	8	77	1	0	1.7	85	8	4.68	0.17	0.77	1.8%	0.3%	10%
All Fresh and processed fruit & veg.	11	105	2	2	4.2	119	14	3.32	0.42	1.38	2.1%	1.9%	13%
Others: Beverage, Cereals and Sugars	7	68	-	-	-	68	-	-	-	-	-	-	-
Live animals and Plants	0	1	-	-	-	1	-	-	-	-	-	-	-
Total Exports	25	252				273	22						
All Meat products (imports-exports)*	14	136	2	3	5.2	63	13	2.43	0.52	1.26	1.7%	2.1%	9%
Total costs and benefits			6	5	11		34	3.10	1	3			

Guyana	Export* US\$ million	Trade US\$	Public costs	Private costs	Total Compliance costs	*Trade SPS+ US\$	Trade Benefits	BC ratio	Costs/ yr	Benefits /yr	% trade	% trade	% trade
All Fishery products	73	733	13	2	15.7	806	73	4.68	1.57	7.33	1.8%	0.3%	10%
All Fresh and processed fruit & veg.	14	136	3	3	5.4	154	18	3.32	0.54	1.79	2.1%	1.9%	13%
Others: Beverage, Cereals and Sugars	390	3,897	-	-	-	3,897	-	-	-	-	-	-	-
Live animals and Plants	1	13	-	-	-	13	-	-	-	-	-	-	-
Total Exports	478	4,779				4,870	91						
All Meat products (imports- exports)*	16	162	3	3	6.2	75	15	2.43	0.62	1.51	1.7%	2.1%	9%
Total costs and benefits			19	8	27		106	3.90	3	11			

ANNEX 6: COSTS AND BENEFITS OF ENHANCED SPS+ MEASURES FOR CARIFORUM COUNTRIES (CONTINUED)

Haiti	Export* US\$ million	Trade US\$	Public costs	Private costs	Total Compliance costs	*Trade SPS+ US\$	Trade Benefits	BC ratio	Costs/yr	Benefits /yr	% trade	% trade
All Fishery products	15	146	3	0	3.1	160	15	4.68	0.31	1.46	1.8%	10%
All Fresh and processed fruit & veg.	36	360	8	7	14.2	407	47	3.32	1.42	4.72	2.1%	13%
Others: Beverage, Cereals and Sugars	4	42	-	-	-	42	-	-	-	-	-	-
Live animals and Plants	1	7	-	-	-	7	-	-	-	-	-	-
Total Exports	56	556				617	62					
All Meat products (imports-exports)*	91	913	16	19	34.9	424	85	2.43	3.49	8.48	1.7%	9%
Total costs and benefits			26	26	52		147	2.81	5	15		

Jamaica	Export* US\$ million	Trade US\$	Public costs	Private costs	Total Compliance costs	*Trade SPS+ US\$	Trade Benefits	BC ratio	Costs/yr	Benefits /yr	% trade	% trade
All Fishery products	14	139	3	0	3.0	152	14	4.68	0.30	1.39	1.8%	10%
All Fresh and processed fruit & veg.	122	1,219	25	23	48.1	1,378	160	3.32	4.81	15.98	2.1%	13%
Others: Beverage, Cereals and Sugars	161	1,607	-	-	-	1,607	-	-	-	-	-	-
Live animals and Plants	3	32	-	-	-	32	-	-	-	-	-	-
Total Exports	300	2,997				3,171	174					
All Meat products (imports- exports)*	84	844	15	18	32.3	392	78	2.43	3.23	7.84	1.7%	2.1%
Total costs and benefits			43	41	83		252	3.02	8	25		

Kitts and Nevis	Export* US\$ million	Trade US\$	Public costs	Private costs	Total Compliance costs	*Trade SPS+ US\$	Trade Benefits	BC ratio	Costs/yr	Benefits /yr	% trade	% trade
All Fishery products	0	1	0	0	0.0	1	0	4.68	0.00	0.01	1.8%	10%
All Fresh and processed fruit & veg.	0	1	0	0	0.0	1	0	3.32	0.00	0.01	2.1%	13%
Others: Beverage, Cereals and Sugars	3	30	-	-	-	30	-	-	-	-	-	-
Live animals and Plants	0	5	-	-	-	5	-	-	-	-	-	-
Total Exports	4	37				38	0					
All Meat products (imports-exports)*	8	80	1	2	3.1	37	7	2.43	0.31	0.75	1.7%	9%
Total costs and benefits			1	2	3		8	2.46	0	1		

Saint Lucia	Export* US\$ million	Trade US\$	Public costs	Private costs	Total Compliance costs	*Trade SPS+ US\$	Trade Benefits	BC ratio	Costs/ yr	Benefits /yr	% trade	% trade
All Fishery products	0	0	0	0	0.0	0	0	4.68	0.00	0.00	1.8%	10%
All Fresh and processed fruit & veg.	8	83	2	2	3.3	94	11	3.32	0.33	1.09	2.1%	13%
Others: Beverage, Cereals and Sugars	27	274	-	-	-	274	-	-	-	-	-	-
Live animals and Plants	0	0	-	-	-	0	-	-	-	-	-	-
Total Exports	36	358				369	11					
All Meat products (imports-exports)*	0	1	0	0	0.0	0	0	2.43	0.00	0.01	1.7%	9%
Total costs and benefits			2	2	3		11	3.31	0	1		

ANNEX 6: COSTS AND BENEFITS OF ENHANCED SPS+ MEASURES FOR CARIFORUM COUNTRIES (CONTINUED)

Saint Vincent and the Grenadines	Export* US\$ million	Trade US\$	Public costs	Private costs	Total Compliance costs	*Trade SPS+ US\$	Trade Benefits	BC ratio	Costs/yr	Benefits /yr	% trade	% trade
All Fishery products	1	9	0	0	0.2	10	1	4.68	0.02	0.09	1.8%	10%
All Fresh and processed fruit & veg.	20	198	4	4	7.8	223	26	3.32	0.78	2.59	2.1%	13%
Others: Beverage, Cereals and Sugars	9	89	-	-	-	89	-	-	-	-	-	-
Live animals and Plants	0	1	-	-	-	1	-	-	-	-	-	-
Total Exports	30	297				324	27					
All Meat products (imports-exports)*	7	149	3	3	5.7	69	14	2.43	0.57	1.38	1.7%	9%
Total costs and benefits			7	7	14		41	2.97	1	4		

Suriname	Export* US\$ million	Trade US\$	Public costs	Private costs	Total Compliance costs	*Trade SPS+ US\$	Trade Benefits	BC ratio	Costs/yr	Benefits /yr	% trade	% trade
All Fishery products	36	361	7	1	7.7	397	36	4.68	0.77	3.61	1.8%	10%
All Fresh and processed fruit & veg.	8	75	2	1	3.0	85	10	3.32	0.30	0.98	2.1%	13%
Others: Beverage, Cereals and Sugars	75	750	-	-	-	750	-	-	-	-	-	-
Live animals and Plants	1	8	-	-	-	8	-	-	-	-	-	-
Total Exports	119	1,194				1,240	46					
All Meat products (imports-exports)*	32	320	6	7	12.2	149	30	2.43	1.22	2.97	1.7%	9%
Total costs and benefits			14	9	23		76	3.30	2	8		

ANNEX 6: COSTS AND BENEFITS OF ENHANCED SPS+ MEASURES FOR CARIFORUM COUNTRIES (CONTINUED)

Trinidad and Tobago	Export* US\$ million	Trade US\$	Public costs	Private costs	Total Compliance costs	*Trade SPS+ US\$	Trade Benefits	BC ratio	Costs/yr	Benefits /yr	% trade	% trade
All Fishery products	67	666	12	2	14.2	733	67	4.68	1.42	6.66	1.8%	10%
All Fresh and processed fruit & veg.	78	784	16	15	31.0	886	103	3.32	3.10	10.27	2.1%	13%
Others: Beverage, Cereals and Sugars	195	1,953	-	-	-	1,953	-	-	-	-	-	-
Live animals and Plants	0	0	-	-	-	0	-	-	-	-	-	-
Total Exports	340	3,403				3,573	169					
All Meat products (imports- exports)*	115	1,149	20	24	43.9	534	107	2.43	4.39	10.67	1.7%	9%
Total costs and benefits			48	41	89		276	3.10	9	28		



Contact:

Inter-American Institute for Cooperation on Agriculture (IICA)

3rd Floor, Baobab Tower

Warrens, St. Michael

BB22026, Barbados

sps.project@iica.int

(246) 271-9210/11/12

Fax: (246) 271-9213