

# Aquaculture Review and Plan of Action – lessons learned, and recommendations



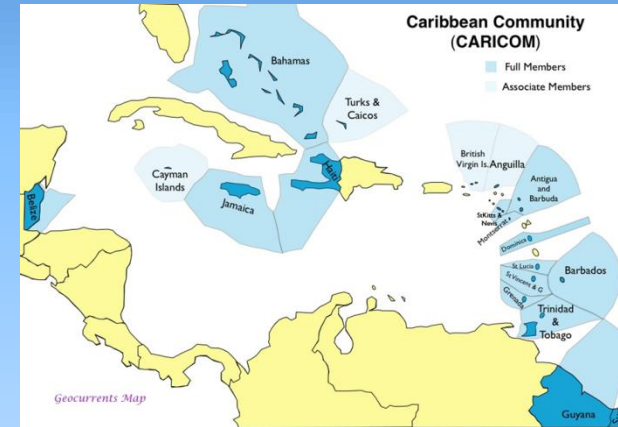
Caribbean Regional Fisheries Mechanism



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# BACKGROUND

- Small Island Developing States
- Reliance on aquatic resources
  - Per capita consumption ~ 32kg (global -19.2kg)
- Dependence on trade
- State of Marine fisheries
- High unemployment (14-15%)
- High Food import bill ~ US\$5 billion/ yr
- Poverty & increasing crime among youth



CARICOM Member and Associate States  
(Note : The maritime boundaries shown in this figure are indicative only, and are without prejudice to any future boundary delimitations processes in which States may be involved)

# Fish Imports (MT)

Year	2006	2007	2008	2009
Quantity	112,198	123,122	116,312	117,252
Value (US\$ 000)	270,594	302,593	346,718	343,098

Overall food import bill ~ **US\$5 billion/yr**

❖ Aquaculture ???

In 2010 aquaculture production was estimated at 6.25% of total Caribbean fisheries production

Demographics suggest that by 2012 the majority of the Caribbean aquaculture production was primarily male dominated

- females being more prevalent in the post-harvest and fish processing sectors.



# Current State of Aquaculture Development

- Not well developed - Low production
- 14,146 MT per year from 2000 -2010
- Belize and Jamaica main producers
- Production peaked at 18,879 MT in 2004
- Declined since 2007 < 10,000 MT
- Signs of Recovery in Belize and Haiti



Seaweed farming Antigua:  
Photo Courtesy of Fisheries Div.  
Antigua

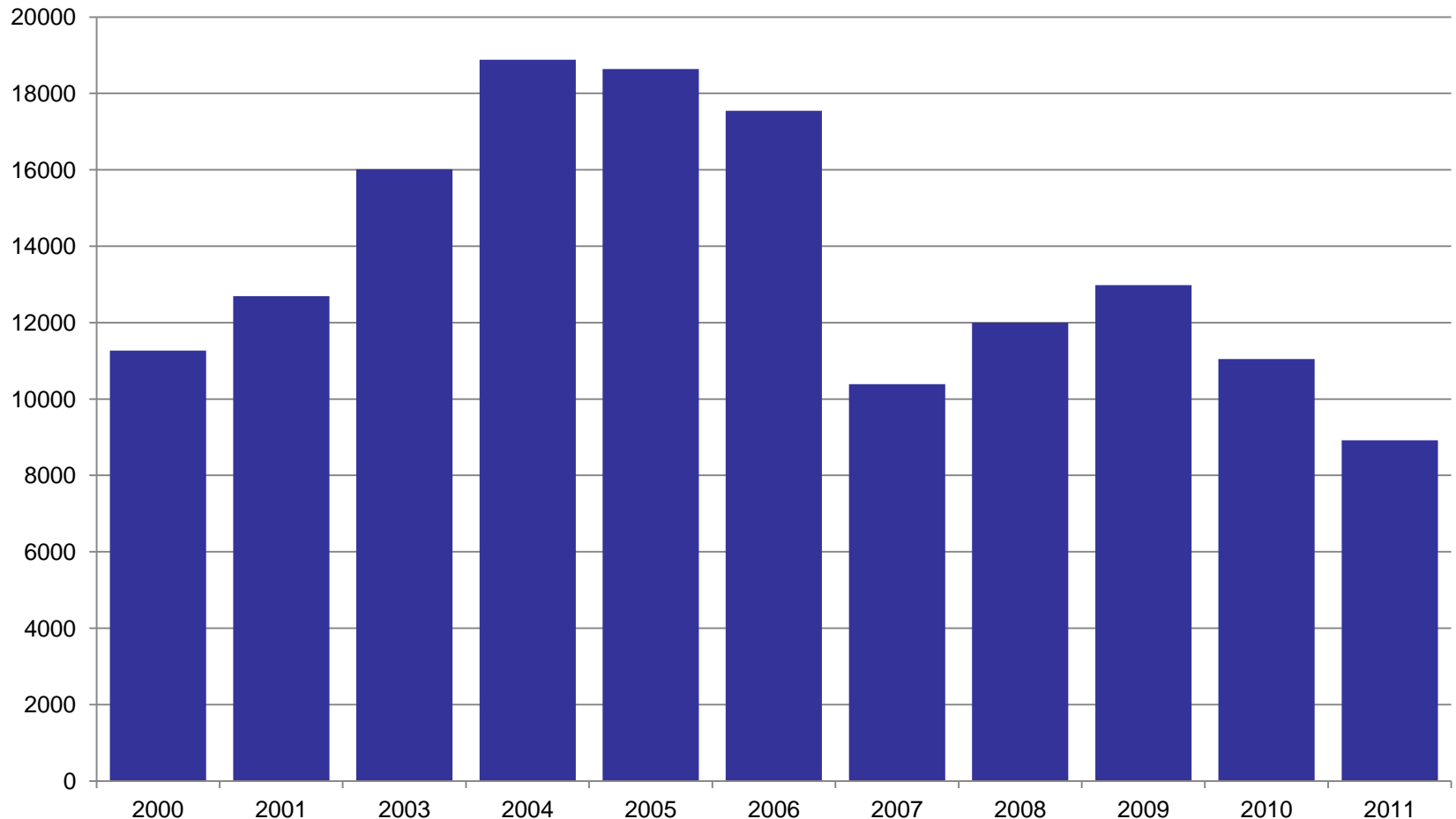


Seaweed products made in Antigua.

Photo – Courtesy  
Fisheries Div. Antigua & Barbuda

# Aquaculture Production

## CARIFORUM States 2000-2011 (MT)



Source: FAO database

# Main Producers –2011 & 2012 (MT)



	<b>2011</b>	<b>2012</b>
<b>Belize</b>	5290	5869
<b>Jamaica</b>	1149	644
<b>Dominican Republic</b>	240	300
<b>Guyana</b>	511	511
<b>Haiti</b>	400	560
<b>Suriname</b>	41	74

# Reasons for Decline

- Global economic downturn
- Falling prices in world markets
- Rising cost of input
  - Financing, Feed, Energy, Transportation
- Security / praedial larceny
- Competition: imports (Vietnam/China)
- Health and Food Safety challenges



# National level of aquaculture development for Cariforum countries

Aquaculture Category - National level of development	Countries
Early Industrial Commercial phase	Belize, Jamaica
Intermediate Developing phase	Dominican Republic, Guyana, Haiti, Suriname
Initial Experimental Pilot phase	Bahamas, Barbados, Dominica, Grenada, St Lucia, St Vincent, Trinidad and Tobago

# What are the Main Species?

Guyana

**Tilapia**, Colossoma,  
indigenous shrimp & fish  
(*P. schmitti*, *P. aztecus*,  
*braziliensis*)(*hassar*)



Tilapia & catfish  
Haiti



Haiti

**Tilapia**, carp, catfish

Suriname

**Tilapia** & marine shrimp  
(*L. vanamaei*)



Small scale backyard commercial tilapia hatchery, Siparia, Trinidad and Tobago

Photo- William Leschen

# What about smaller Islands?

- Tilapia, seaweed, shrimp
- Limitations – land, fresh water, human
- Aquaponics – fish and vegetables



Seaweed farming in  
St. Lucia



Cobia farming in  
seawater

Photo: Fisheries Dept, Belize



Tilapia farming in  
seawater – St. Kitts

# AQUAPONICS – FARMING OF FISH & VEGETABLES



Aquaponics: recirculating system family farm (Belize)

# Why interest ?

- Economic resilience
- Increase local supply of fish
- Food & nutrition security
- Employment
- Poverty reduction
- Revitalize communities
- Earn hard currency - export-oriented



# Policy commitment

- **CARICOM Strategic Plan (2015-2019)**
- **CRFM Strategic Plan (2013-2021)**
  - A strategy to increase supply of fish
  - Adopt Ecosystem approach to aquaculture
  - Establish Regional Working Group
  - Enabling policy and legal frameworks
  - Voluntary guidelines, best management practices and standards

# Aquaculture Governance in the Caribbean

State/Group		Policy & Planning			Legislation		Admin. Support		
Country Group	Country	Policy	Strategy	Nat. Dev. Plan	Fish Act Provsn	Aqua. Spcf. Act/Regs	Import Permit	Licensing Facilities	Extensi on Adv. Sup
Continental Countries and Greater Antilles	Belize		X <sup>D</sup>		X	X <sup>D</sup>	x	X	X
	Dominican Republic								
	Guyana								X
	Haiti								
	Jamaica			X					X
	Suriname								
Lesser Antilles	Bahamas					X <sup>D</sup>			
	Barbados								
	Dominica	X			X				
	Grenada	X			X				
	St. Kitts Nevis		X						
	St. Lucia			X					
	St. Vincent	X							
	Trinidad and Tobago	X							x

**Key:** Nat. Dev. Plan = National Development Plan Fsh. Act Provsn = Fisheries Act Provision  
 Aqua. Spcf. Act/Regs. = Aquaculture Specific Act and/or Regulations Adv. Sup. = Advisory Support  
 D = Draft

# Suitability assessment for spp currently or recently cultured in the region

Key:

xxxx = best case    x = worst case.

x (?) = worst case and information insufficient/unavailable

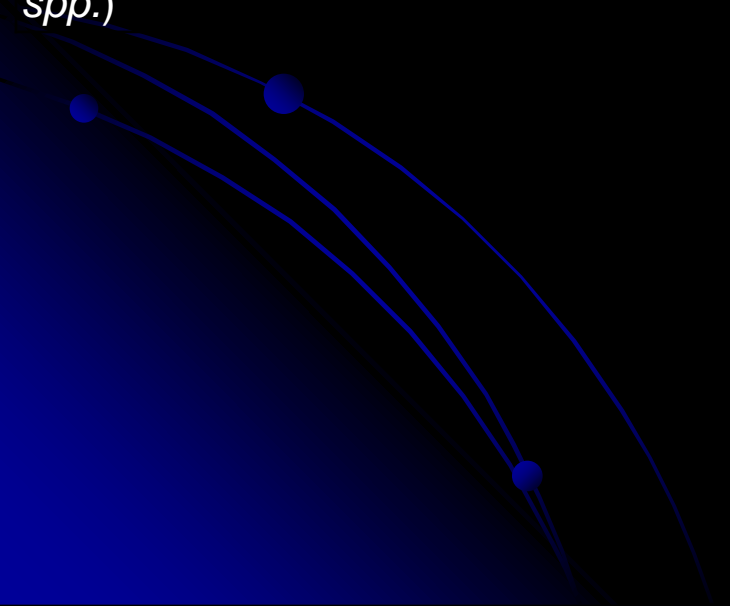
Sp./Group	Control of Breeding	High Fecundity	Short Larval Cycle	Rapid Growth	Simple Tech'ology	Compound Diet Available	Fingerling Avail'ty	Market Potential
<b>Freshwater Species : Indegenous Stocks</b>								
Bay Snook <i>(Petenia splendida)</i>	x	xx	xxx	x	xxx	x	x	xx
Tambaqui <i>(Colossoma macroporum )</i>	xxx	xxx	xxx(?)	xxx	xxx	x	xx	xx
Hassar or Bashaw <i>(Micropogonias furnieri)</i>	x	x (?)	xx?	x(?)	x ?	x	x	x
Lukanani <i>(Chicla ocellaris)</i>	x	x(?)	xx	x	xxx	x	x	xx
Grey Mullet <i>(Mugil cephalus)</i>	x	xx(?)	X(?)	x(?)	x(?)	x	x	xxx

Spp./Group	Control of High Breeding	Fecundity	Short Larval Cycle	Rapid Growth	Simple Tech'ology	Compound Diet Available	Fingerling Avail'ty	Market Potential
<b>Freshwater Species : Indegenous Stocks</b>								
Tilapia <i>(Oreochromis niloticus)</i>	xxx	xxxx	xxx	xxxx	xxxx	x	x	xx
Cascadura or Kwiekwie <i>(Hoplosternum littorale)</i>	x	x(?)	x(?)	x(?)	xx(?)	x	x	xx
Eel <i>(Anguilla rostrata)</i>	xxx	xxxx	xx	xx(?)	xxx	xxx	x	xxx
Giant Freshwater Prawn <i>(Macrobrachium rosenbergii)</i>	xxx	xxx	xx	xxx	xx	xxxx	xx	xx
Freshwater Lobster <i>(Macrobrachium acanthurus)</i>	x	x(?)	xx	xx	xx(?)	x(?)	xx(?)	x(?)

Spp./Group	Control of High Breeding	Fecundity	Short Larval Cycle	Rapid Growth	Simple Tech'log	Compound Diet Available	Fingerling Avail'ty	Market Potential
<b>Marine Species</b>								
Red Drum <i>(Sciaenops ocellatus)</i>	xxx	xxx	Xxx	xxx	xx	xxx	x	xxx
Dolphin Fish <i>(Coryphaena hippurus)</i>	xx	xxx	X	x(?)	x(?)	xx(?)	x	xxxx
Cobia <i>(Rachycentron canadum)</i>	xx	xxxx	Xxx	xxxx	xx	xxxx	x	xx
Pompano <i>(Trachionotus carolinus)</i>	x	xxx	Xxx	xx	xx	xx	x	xxx
Pacific White Shrimp <i>(Penaeus vannamei)</i>	xxxx	xxxx	Xxx	xxxx	xx	xxxx	x	xxxx
Caribbean White Shrimp <i>(Penaeus schmitti)</i>	xx	xxxx	Xxx	xx	xx	xxx	xx	xx

Spp./Group	Control of High Breeding	Fecundity	Short Larval Cycle	Rapid Growth	Simple Tech'logy	Compound Diet Available	Fingerling Avail'ty	Market Potential
Marine Species								
Mexican Brown Shrimp ( <i>Penaeus aztecus</i> )	x	xx(?)	xx(?)	xx(?)	xx(?)	xx(?)	x	xx
Australian Freshwater Lobster ( <i>Cherax quadricarinatus</i> )	xxx	xx	Xxx	xx	xx	xxx	x	x
Grass Shrimp ( <i>Penaeus monodon</i> )	xxx	xxx	Xxx	xxxx	xx	xxx	x	xx
Spiny Lobster ( <i>Panulirus argus</i> )	x	xxx	X	x	x	x	x	xxxx
Mangrove Oyster ( <i>Crassostrea rhizophorea</i> )	xx(?)	xxxx	xx	x	xxx	-	x(?)	x

Spp./Group	Control of Breeding	High Fecundity	Short Larval Cycle	Rapid Growth	Simple Tech'logy	Compound Diet Available	Fingerling Avail'ty	Market Potential
Queen Conch ( <i>Strombus gigas</i> )	xx	xxx	Xx	x	xx	xx	x	xxxx
Sea Moss ( <i>Gracilaria spp.</i> )	xx	-	-	xxxx	xxxx	-	xxx	xxx



# Recent Donor Support

- ACP Fish II - policy and legislation
- USAID and FAO - Guyana
- Taiwanese - St. Lucia, Dominica and Belize
- Haiti – Significant investments since earthquake (Cuban Gov, Clinton Foundation, Operation Blessing Intl...)
- JICA – Belize and Jamaica

- ACP Fish II supported primarily National Policy development
  - Strategic assessment of the aquaculture potential in Haiti
  - Aquaculture land and water use development plan for Jamaica
  - Aquaculture development strategy for St. Kitts and Nevis
  - Fisheries and aquaculture policy Dominica Grenada, and St. Vincent & the Grenadines
  - Support to formulate a fisheries and aquaculture policy for Dominican Republic

# Main Constraints

- High input cost (energy, feed, land ...)
- High cost of credit – cash flow to support
- Seed supply
- Water management systems
- Competition from imports from Asia & S. America
- Health and Food Safety Systems
- R & D, Extension & Support Services
- Lack of Skilled & Quality Human Resources
- Climate change & disaster risk disaster
- Policy, legislation, governance

# CONCLUSION

Aquaculture has the potential for making significantly greater contribution to the region's development

Notwithstanding that

- It has not been widely promoted and supported as an important economic activity in the region
- It faces numerous constraints for environmental and economic sustainability and international competitiveness

- Growing interest in aquaculture
- Important role in food security, poverty reduction, employment, & blue economy
- Policy and regulatory reforms, technical support, capacity building, and investments need to realize the potential of the sector

# 5-year PoA

Objective/ Thematic Area	Activities	Beneficiaries	Time-line				
			Yr 1	Yr 2	Yr 3	Yr 4	Yr 5
Strengthening governance frameworks	Support formulate enabling national aquaculture policies, strategies, legislative framework, instutional frameworks at the public and private sector level	Bah., Bdos. Bz., Jam., DR, Haiti Guy., Sur. Jam., DR., Guy., Sur, Haiti	X	X			
Capacity Building	Strengthening of educational institutions in the region; support for study tours to country ; Strengthen collaboration with the private sector; Training Workshops (	Bah., Bdos., Bz., Jam., DR, Guy., Sur. Bz., Jam., DR, Guy., Sur., T&T	X	X	X	X	X
	1 – 2 yrs MSc Aqua Programmes	Bz, Jam. Guy.	X	X	X		
	2 – 3 Yrs PhD Aqua Programmes	St. Lucia, St. Kitts-Nevis		X	X		

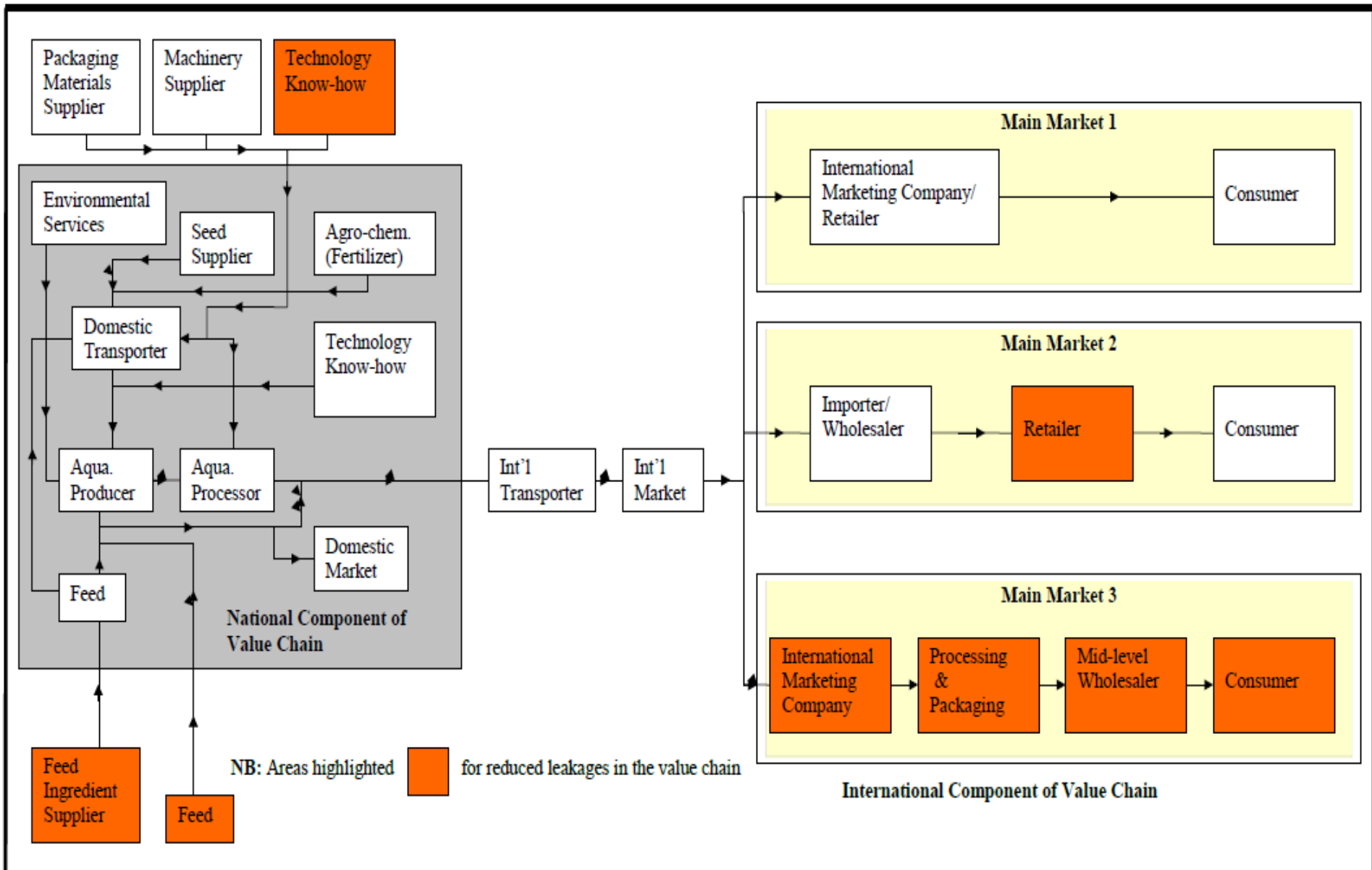
Objective/ Thematic Area	Activities	Beneficiaries	Time-line				
			Yr 1	Yr 2	Yr 3	Yr 4	Yr 5
Strengthening Data Mgmt Syst. For Aquaculture	Development of the Management Information systems data collection;. Capital Assistance Equipment Grant ; Set up info exchange network	All Countries	X	X	X		
Strengthen Credit regimes	Access US\$10 million soft loan to Credit Unions to on-lend to Small farmers	Bah., Bdos., Bz., Jam., DR, Haiti, Guy., Sur. Bz., Jam., Guy., Sur., T&T		X	X	X	X
	Access US\$25 million soft loan to on-lend to farmers to dev 20 start-up shrimp farms and Tilapia Farms	Bz., Jam. Guy., Sur, DR			X	X	X

Objective/ Thematic Area	Activities	Beneficiaries	Time-line				
			Yr 1	Yr 2	Yr 3	Yr 4	Yr 5
Market Studies	Market feasibility studies for indigenous and locally occurring species	Bz, Guy, Sur, T&T, JAM			X	X	
	Market and Technical feasibility assessments of Ornamental Fish Culture	Dom., St. Kitts/Nevis, Grenada, St. Lucia, St. Vincent		X	X		
R&D	Industry research local feed material substitution small scale fish farming; Strengthen south south cooperation for the transfer of technologies and production systems to the Caribbean ; Support the development of the value chanin for aquaculture	All Countries	X	X	X	X	X

Objective/ Thematic Area	Activities	Beneficiaries	Time-line				
			Yr 1	Yr 2	Yr 3	Yr 4	Yr 5
R&D cont'd	Industry research fishmeal substitute; Institutional research reproductive biology indigenous and local species; Institutional Research Low trophic level species (sea urchin, sea cucumber, blue land crab)	All Countries	X	X	X	X	X
Adaptation to Climate Change	Generation disaster preparedness plan for sector	Bz, Jam. DR, Haiti		X	X		
	Feasibility study on crop insurance for sector. Mainstreaming CC consideration in aqua plan	Bz, Jam. DR, Haiti				X	X

# A reminder

**Fig. 6: Current Value Chain Analysis for the Aquaculture Sector**



## Other activities

- Regional exchanges with Africa and Pacific
- Utilization of waste – guts, etc
  - Improving production and access to low cost good quality feeds
  - Reducing energy cost and cost of land and access to land for aquaculture
  - Improving marketing including access to regional and international markets
  - Improving fish health and food safety systems
- Capacity building on co-operative approaches, online approach
- Regional conference on aquaculture – private sector/ public

# Future support needed

- Strengthening of governance frameworks
- Building capacity at various levels
- Knowledge management - Data gathering, documenting and sharing of information
- Strengthening credit regimes - SME
- Lower cost, good quality feeds
- Reducing energy cost
- Fish health and food safety systems
- Marketing including regional & international trade

- Environmental management / ecosystem sustainability
- Climate change & disaster risk management
- Research and Development
  - indigenous and locally occurring species (low trophic level spp. e.g. sea cucumber)
  - alternative feeds, fish meal
  - alternative / renewable energy systems
- Partnership
  - Inter- ACP (knowledge sharing)
  - EU –ACP private sector partnership

# Working group tasks

The Working group should consider the:

- existing governance frameworks for Aquaculture
- suitability of species for aquaculture
- current value chain analysis for aquaculture

Against the backdrop of the above, the Working group should discuss the 5-year PoA and:

- suggest possible improvements/amendments
- make proposals to ensure/encourage implementation of the PoA
- suggest appropriate development partners for support to specific aspects of the PoA

*Thank you*

**Merci  
Mèsi**

**Dank je wel**

**Arigato gozaimasu**



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