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REPORT OF A TRAINING COURSE ON SANITARY AND PHYTO-SANITARY MEASURES IN FISHERIES AND AQUACULTURE FOR CARIFORUM MEMBER STATES

**United Nations University - Fisheries Training Programme
Iceland, 18-29 April 2016**

**CRFM Secretariat
2017**



CARIFORUM

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Prepared by: United Nations University – Fisheries Training Programme

Under contract to the Caribbean Regional Fisheries Mechanism (CRFM) Secretariat through the 10th EDF funded Sanitary and Phytosanitary (SPS) Measures Project

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ACRONYMS AND ABBREVIATIONS

AHFS	Agricultural Health and Food Safety
BAHA	Belize Agricultural Health Authority
BAHFSA	Bahamas Agricultural Health and Food Safety Authority
CA	Competent Authority
CAHFSA	Caribbean Agricultural Health and Food Safety Agency
CARICOM	Caribbean Community
CARIFORUM	Caribbean Forum of African, Caribbean and Pacific (ACP) states
CCP	Critical Control Point
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CNMSF	National Committee for the Application of Sanitary and Phyto-Sanitary Measures
CRFM	Caribbean Regional Fisheries Mechanism
CROSQ	CARICOM Regional Organization for Standards and Quality
DoF	Department/Division of Fisheries
EC	European Commission
EDF	European Development Fund
EPA	Economic Partnership Agreement
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FDA	Food and Drug Administration
FMIS	Fish Auction Market (Fiskmarkadur Islands)
GHP	Good Hygiene Practices
GMP	Good Manufacturing Practices
GSP	Good Storage Practices
HACCP	Hazard Analysis and Critical Control Points
HPLC	High-performance Liquid Chromatography
IICA	Inter-American Institute for Cooperation on Agriculture
MAST	Icelandic Food and Veterinary Authority
MCS	Monitoring, Control and Surveillance
MoU	Memorandum of Understanding
MRI	Marine Research Institute
NAHFCA	National Agricultural Health and Food Control Agency
NGO	Non-Governmental Organization
OIE	World Organization for Animal Health
PMU	Project Management Unit
QC	Quality Control
R&I	Research and Innovation
RCCP	Regional Central Collection Point
SPS	Sanitary and Phyto-Sanitary
SOP	Standard Operating Procedures
SSOP	Sanitation Standard Operating Procedures
SVG	St. Vincent and the Grenadines
TBT	Technical Barriers to Trade
ToR	Terms of Reference
UNU-FTP	United Nations University – Fisheries Training Programme
USA	United States of America
WTO	World Trade Organization

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1. INTRODUCTION

Sanitary and phytosanitary measures (SPS) to ensure wholesomeness and safety of food and food products as stated in the WTO SPS agreements have been implemented world-wide by countries exporting food products. International markets have become increasingly strict that such measures are implemented by exporting countries. Failure to comply with the strict measures has resulted in bans on import from those countries. In particular the European Community (EC) has taken the stand of non-negotiation when it comes to adhering to the SPS measures by countries exporting to the EU markets.

Foreign export markets are important to many of the countries in the Caribbean, so called the CARIFORUM states, and there is a need to develop regulations to introduce SPS measures and to train people in implementing such measures. The challenges are many and the CARIFORUM states are receiving support from the EU, currently via the 10th EDF Programme “Support to the Forum of Caribbean States in the implementation of the commitments undertaken under Economic Partnership Agreement (EPA): Sanitary and Phytosanitary (SPS) measures”. The Inter-American Institute for Cooperation on Agriculture (IICA) is the implementing agency for the 10th EDF Programme, on behalf of the Caribbean Regional Fisheries Mechanism (CRFM).

The United Nations University Fisheries Training Programme (UNU-FTP) was identified as a partner in designing a short course to be held in Iceland for fisheries stakeholders, both from the public and private sector that play an important part in implementing SPS measures in the CARIFORUM states. The CRFM and UNU-FTP have cooperated on fisheries development in the Caribbean, in particular institutional capacity building, since 2006 through MoUs. Fisheries professional people have, e.g., undertaken training in UNU-FTP’s 6 months training programme which is conducted every year. A large part of the cooperation has been through design and implementation of short courses in the Caribbean on key fisheries issues identified by CRFM. At the time of writing this report, 18 fisheries professionals have completed the 6 month training programme in Iceland and over 120 have attended the six short courses and workshops held in the Caribbean region. In addition five fisheries directors have participated in a study tour of Icelandic fisheries and one former fellow has completed MSc studies in Iceland under a UNU-FTP scholarship.

Within the UNU-FTP the knowledge of the Caribbean fisheries and the understanding of their challenges and needs have grown over the years. Much knowledge has accumulated through the participation of fellows from the Caribbean and their individual research projects at the UNU-FTP and experts from UNU-FTP partners in Iceland have been involved in the development and delivery of several short courses, workshops and consultancies in the Caribbean.

In February 2016, a proposal for development and implementation of an SPS course was submitted to IICA and approved (Appendix 1). Following the approval, the written ToR (Appendix 2) and a Contract for Professional Services was signed by IICA and UNU-FTP. The latter half of February and the whole month of March (extending into April) was used for the planning of the course, including selection of participants and their travel arrangements. Selection of participants was done in close cooperation with CRFM and was based on candidates CVs and letters of application which were screened by CRFM staff and UNU-FTP. It was agreed to include some broader aspects of fisheries – both through lectures and site visits – to widen the participants’ views on the role of SPS measures in fisheries development.

The goal of the course and the objectives were:

Goal

The course is for fisheries professionals from CRFM member states centered on topics related to sanitary and phytosanitary measures in the region. Moving from theory into practice, the course pairs a theoretical

and regulatory framework and mechanisms through which these principles can be operationalized in the Caribbean through a market driven fisheries industry. Through a combination of lectures, site visits, and guided group discussions, participants will gain a deeper understanding of SPS and related principles and investigate means to implement these principles.

Objectives:

- To review the regulatory framework of SPS measures in fisheries and aquaculture.
- To provide the participants with perspectives on how SPS measures have developed in relation to world fisheries.
- To help participants to identify challenges in their home countries regarding implementing SPS measures.
- To strengthen the ability of participants to implement appropriate SPS measures for their countries and the region as a whole.
- To introduce participants to a fishing industry that is value- and market driven and complies with international SPS standards.
- To introduce key elements of a fishery that is both economically and biologically sustainable.

The UNU-FTP partnered with Matis Ltd – Icelandic Food and Biotech R&D in organizing the course. Matis holds expertise in SPS and has done consultancy work in the Caribbean on the development of national and regional environmental monitoring programmes related to SPS in fisheries in the CARIFORUM States. Some aspects of the short course were developed based on the outcome of the consultancy report, mainly in areas that needed further attention.

The course consisted of lectures, site visits, field trips and group work.

2. STRUCTURE OF THE COURSE

The course consisted of about 30 lecture hours, two field trips with the objective to show participants how fisheries and the use of natural resources have developed in relation to culture and economic development. The emphasis in the lectures was on issues related to formulation and implementation of SPS measures that meet the criteria of international markets (mainly the EU market). The lectures also dealt with how fisheries management systems influence sector development and this was amongst other illustrated through a historical review of Icelandic fisheries and study visits to institutions, departments, organizations and private companies in the fisheries sector. One morning was devoted to leadership and empowerment to emphasize the importance of leadership in the process of implementing SPS measures nationally. Participants were introduced to seven companies and institutions in the fisheries sector, including fish processing factories and companies providing technological solutions and other support to the sector (Appendix 3). The fish processing companies visited ranged from small and with relative simple processing to highly advanced, but all catering for international markets. During the visits, participants met with both marketing professionals and quality managers and asked questions about the operation and markets. Three assignments were given to the participants which they delivered and shared their views on the development of SPS measures nationally and regionally.

The lecturers (Figure 1) came from the lead institutions working in fisheries in Iceland: Marine Research Institute, Matis Ltd – Icelandic Food and Biotech R&D, University of Iceland, University of Akureyri and the Ministry of Agriculture and Fisheries.

Participants were given several group assignments to orient them to the issues at hand, and to give them opportunities to share their views on the status and future prospects of the implementation of SPS

measures in their home countries (see later in the report for the output of those assignments). The assignments were:

1. Country presentation on the challenges and work underway addressing SPS measures.
2. Design of HACCP systems for processing of selected species (products) in the Caribbean (group work).
3. Discussion on:
 - i) Monitoring and collection of data for SPS implementation;
 - ii) Cooperation among diverse agencies for successful implementation of SPS measures;
 - iii) Training that is available and necessary for SPS measures; and
 - iv) Research on SPS measures that is being conducted and by whom in the region.
4. Implementing various issues under SPS measures and measures of success (indicators).

The topics of some of the assignments were chosen in relation to recommendations put forward in a consultancy report from Matis Ltd. (written by Mr. M. Gissurason, and Dr. H. Gunnlaugsdottir) 2015: “Consultancy to provide technical support to develop national and regional environmental monitoring programme related to SPS for fishery and aquaculture products in CARIFORUM states” (CRFM, 2015).

The schedule of the course, as it was planned, is shown in Figure 1. Minor changes were made during the course. On April 20th the visit to Ny-fiskur in relation to HACCP work was not possible, and so more time was spent on theoretical aspects of HACCP instead. However, no changes were made to the agreed content.

Evaluation

There were two evaluation mechanisms used during this training course. The first was a semi-structured focus group reflection aimed at drawing out the elements of the course that participants found particularly useful or interesting, as well as how they planned to use what they learned upon their return home. The second was an anonymous online evaluation. In this written evaluation, participants were asked a series of questions and to rate the course including which topics they found most relevant, and how the course changed their views on SPS.

3. PARTICIPANTS

The participants were selected through CRFM initiatives and screening by the UNU-FTP. Participants submitted their CVs and only those who appeared to play an active role in formulating and implementing SPS measures in their home countries were invited. Only one representative was from CRFM Secretariat, but it was considered important that CRFM would follow such a course since the CRFM Secretariat would be a significant mediator in the implementation of SPS in the Caribbean. CRFM participation in the course would support future follow-up and communication with the participants.

A total of 18 participants (Table 1), ten men and eight women, were able to attend the course from 13 countries (including the CRFM Secretariat). Five countries had two representatives each, which was in line with UNU-FTP strategy of having 2-3 from each country. Having two or more participants from the same country helps them to acquaint themselves better with the subject. Also, participants should get more support in practicing what they have experienced and learnt when returning home.

Overall, getting all of the participants to Iceland was successful, but for future reference the organizers recommend allowing more time for acquisition of visa to Europe/USA/Iceland since most of the countries (members) require visa into Europe and USA, and some of the flights were directed through the US. In addition to the visa requirements, some of the participants needed to purchase travel insurance in order to get the appropriate visa. The administration around the visa and insurance increased the travel costs.

All except one participant completed the two-week course. The participant from Grenada did not complete the course due to sudden illness.

The participants contributed to the course outcome through presentations on their national challenges and discussion groups on various topics.

Schedule for the UNU-FTP/CRFM short course on SPS measures in the Caribbean													
	18.apr	19.apr	20.apr	21.apr	22.apr	23.apr	24.apr	25.apr	26.apr	27.apr	28.apr	29.apr	
0800-0900			HACCP theories and procedures (MG)								At Matis Taxi from Hotel (0830)		
0900-1000	Opening (TT) Schedule (TA) Partisip introduction (MF)	Cleaning and sanitation	Ny-fiskur processing Visit (1000) HACCP systems in fish processing	Snæfellsnes field trip - Nature, history, small fishing communities - Lunch on the road	Sampling techniques (FG)	Empowerment, leadership and implementation (Ársæll Arnarson) 0900-1130	OFF (Enjoy Reykjavík)	Buyers requirements (MG)	Food outbreak investigation and epidemiology (HG)	Chemical risks and official control requirements in EU (HG)	Food safety and monitoring (HG)	Packaging material (HJ)	
1000-1100	WTO/SPS/TBT (MG)	Fishing for profits (DMK)			Processing water- Quality aspects			Marketing of fish (ThP)	Risk assessment (HG)		Food Fraud (JV)	Value Addition (JV)	
1100-1200	SPS and world fisheries (GV)	Development of Icelandic fisheries (HV)			Lunch (MRI)	?			Aquaculture (RJ)		Value Chain (DMK)		
1200-1230	Lunch (MRI)				Lunch (MRI)			Lunch (MRI)			Lunch (MATIS)		
1230-1330	Fish Handling	HB Grandi (1300) Visit	Group-work (HACCP)	Pick-up at hotel	Group assignment: Implementation of SPS in the Caribbean	Excursion: Hellisheidar power plant (1300)		Fish Auction (13:15)	Field visit: 1300-1430 MAREL fish processing technology development 1515 Stolt - aquaculture	Visit: MAST the Icelandic Food and Veterinary Authority	Aquaculture and fish health (RJ)	Wrap-up Discussions Evaluation	
1330-1430	Microbiological risks (FG)												
1430-1530													
1530-1630		Country presentations (5 minutes) Discussions	Delivery: GW			Delivery: GW		Thingvellir National Park (historic site)					
	Companies	HB Grandi	Lecturers:										
		Ný-fiskur	MG	Margeir Gissurarson									
		Stolt - fiskeldi	GV	Grímur Valdimarsson									
		Sudurnes auction market	FG	Franklín Georgsson									
		MAST	HV	Hreiðar Þór Valtýsson									
		Matís	ÁA	Ársæll Arnarsson									
		Marel	ThP	Þóthelir Pálsson									
			Auction market control and data clearing house										
			HG	Helga Gunnlaugsdóttir									
			JV	Jonas Viðarsson									
			RJ	Ragnar Jóhannsson									
			DMK	Daði Már Kristófersson									
			HJ	Hrönn Jörundsdóttir									

Figure 1: The schedule for the SPS course for CARIFORUM April 18 – 29, and the list of lecturers from lead institutions noted in the text

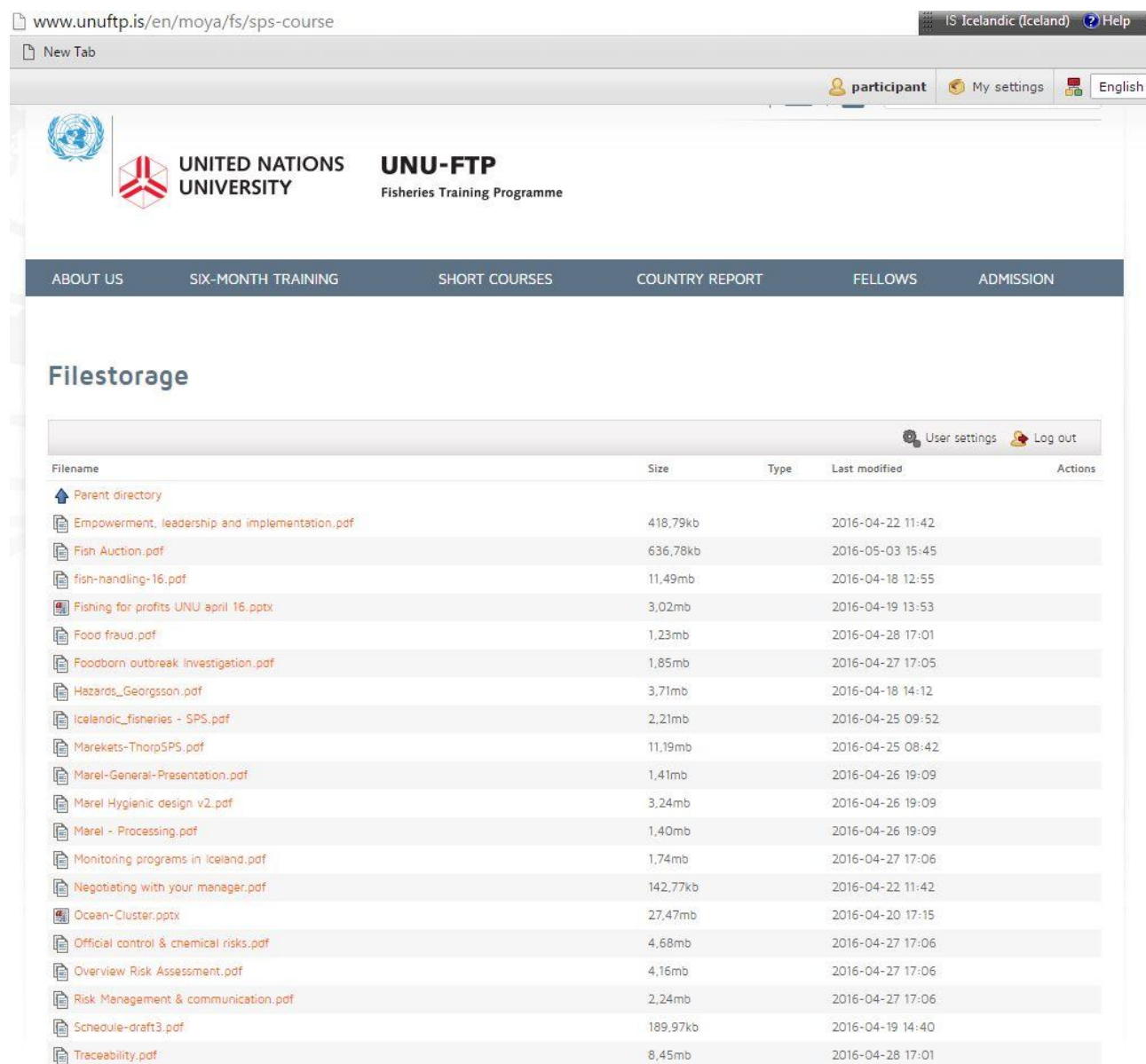
Table 1: Selected SPS course participants and their country of origin

	Country	Name	Email contact
1	Antigua & Barbuda	Wesley Simon	wesleysimon65@gmail.com
2		John Webber	bbqfisheries@yahoo.com
3	Barbados	Joyce Leslie	Joyce.leslie27@gmail.com
4		Sherlock King	sherlockking@yahoo.com
5	The Bahamas	Patricia Bethel	pbethel@yahoo.com
6		L'Dina Pelecanos	ldpelecanos@gmail.com
7	Belize	Endhir Sosa	endhir.sosa@baha.org.bz
8	Dominican Rep.	Jeanette Mateo	jeannettemateo@gmail.com
9	Grenada	Johnson St. Louis	johnson.stlouis@ymail.com
10	Guyana	Denzil Roberts	bertz99@gmail.com bertz99@yahoo.com
11		Mark Pierre	ahandfss@gmail.com
12	Jamaica	Wintorph Marsden	winty@cwjamaica.com wfmarsdem@moa.gv.jm
13	St. Lucia	Petronila Polius	petronila.polius@govt.lc
14	Suriname	Juliette Colli-Wongsoredjo	julcol_2009@yahoo.com viskeuringsinstituut@gmail.com
15		Farida Mentowidjojo	Farida_vk@hotmail.com
16	St. Vincent & the Grenadines	Ferique Shortte	feriqueshortte@gmail.com
17	Trinidad & Tobago	Garth Ottley	Garthottley1@gmail.com
18	CRFM Secretariat	Susan Singh-Renton	susan.singhrenton@crfm.int

4. RESULTS / OUTPUT

4.1 Course material

All lecture material was shared through a UNU-FTP repository (filestorage) and participants had access to the lecture material for several months. Access to the course material was through unuftp.is intranet with username: *sps* and password: *sps16* (Figure 2)



The screenshot displays the UNU-FTP Filestorage interface. At the top, there is a navigation bar with links: ABOUT US, SIX-MONTH TRAINING, SHORT COURSES, COUNTRY REPORT, FELLOWS, and ADMISSION. Below this, the 'Filestorage' section is visible, featuring a table of files. The table has columns for Filename, Size, Type, Last modified, and Actions. The files listed include various PDFs and PPTX files related to fisheries training, such as 'Empowerment, leadership and implementation.pdf', 'Fish Auction.pdf', 'fish-handling-16.pdf', 'Fishing for profits UNU april 16.pptx', 'Food fraud.pdf', 'Foodborn outbreak investigation.pdf', 'Hazards_Georgsson.pdf', 'Icelandic_fisheries - SPS.pdf', 'Markets-ThorpSPS.pdf', 'Marel-General-Presentation.pdf', 'Marel Hygienic design v2.pdf', 'Marel - Processing.pdf', 'Monitoring programs in Iceland.pdf', 'Negotiating with your manager.pdf', 'Ocean-Cluster.pptx', 'Official control & chemical risks.pdf', 'Overview Risk Assessment.pdf', 'Risk Management & communication.pdf', 'Schedule-draft3.pdf', and 'Traceability.pdf'. The interface also includes a 'User settings' link and a 'Log out' button.

Filename	Size	Type	Last modified	Actions
Parent directory				
Empowerment, leadership and implementation.pdf	418,79kb		2016-04-22 11:42	
Fish Auction.pdf	636,78kb		2016-05-03 15:45	
fish-handling-16.pdf	11,49mb		2016-04-18 12:55	
Fishing for profits UNU april 16.pptx	3,02mb		2016-04-19 13:53	
Food fraud.pdf	1,23mb		2016-04-28 17:01	
Foodborn outbreak investigation.pdf	1,85mb		2016-04-27 17:05	
Hazards_Georgsson.pdf	3,71mb		2016-04-18 14:12	
Icelandic_fisheries - SPS.pdf	2,21mb		2016-04-25 09:52	
Markets-ThorpSPS.pdf	11,19mb		2016-04-25 08:42	
Marel-General-Presentation.pdf	1,41mb		2016-04-26 19:09	
Marel Hygienic design v2.pdf	3,24mb		2016-04-26 19:09	
Marel - Processing.pdf	1,40mb		2016-04-26 19:09	
Monitoring programs in Iceland.pdf	1,74mb		2016-04-27 17:06	
Negotiating with your manager.pdf	142,77kb		2016-04-22 11:42	
Ocean-Cluster.pptx	27,47mb		2016-04-20 17:15	
Official control & chemical risks.pdf	4,68mb		2016-04-27 17:06	
Overview Risk Assessment.pdf	4,16mb		2016-04-27 17:06	
Risk Management & communication.pdf	2,24mb		2016-04-27 17:06	
Schedule-draft3.pdf	189,97kb		2016-04-19 14:40	
Traceability.pdf	8,45mb		2016-04-28 17:01	

Figure 2: The collection of the course material stored on the web site of the UNU-FTP at <http://www.unuftp.is/en/moya/fs>

4.2 Assignment 1: National challenges and current issues

Participants were asked to reflect, through short presentations, on the major national challenges facing the implementation of SPS measures and also indicate what was being done to facilitate the implementation. The responses were coded and categorized (Table 2) and compared among the countries. Overall, most of the issues mentioned fall within the realm of the government. A few issues, such as related to the

availability and use of ice, various technical matters and vessels, would be handled by the industry. Of the 13 countries, 63% mentioned revision of existing rules and regulations, and legislation related to SPS issues. The second item mentioned as one of the challenges was the limited or lack of cooperation or coordination among institutions and organizations. The third most common issue was related to the improvement of landing sites and laboratories. Very few mentioned lack of monitoring and lack of skilled people.

The countries were addressing many of the issues identified (Table 3), but to varying extent. Many were working on upgrading their legislation and activating existing SPS protocols. Training of staff and other people in fisheries generally does not seem to be a priority, although some systematic training of fisheries people appears to be on-going in three countries, Jamaica, Guyana and St. Vincent and the Grenadines (SVG).

Table 2: Summary of identified challenges in implementing SPS measures in the CARIFORUM countries

	Governance/Government									Industry				
Country	Improvement (accreditation) of labs	Lack of political priority	Limited or no guidelines for SPS	New or revised laws	Weak enforcement	Lack of environmental monitoring	Lack of funds	Limited coordination/ cooperation (inter-agency and fisherfolk)	Lack of available people (inspectors)	Improvement of landing sites	Ice problem	Technical complexity	Unwilling artisanal sector	Vessel upgrade
St. Lucia														
Barbados										✓	✓			✓
Antigua	✓		✓	✓						✓				
Tobago			✓	✓			✓	✓					✓	
Belize	✓									✓				
Guyana				✓				✓		✓	✓			
Grenada				✓							✓			✓
Jamaica				✓				✓						
Bahamas														
SVG		✓			✓									
Dom Rep	✓	✓		✓		✓	✓	✓				✓		
Trinidad		✓		✓			✓	✓	✓			✓		
Suriname	✓		✓	✓				✓						
	4	3	3	8	1	1	3	6	1	4	3	2	3	2
	31%	23%	23%	62%	8%	8%	23%	46%	8%	31%	23%	15%	23%	15%

Table 3: On-going tasks towards improving SPS measures in the CARIFORUM states

Dominican Republic	<ul style="list-style-type: none"> ✓ Monitoring and control at airports. ✓ Updates on SPS applicable regulations. ✓ HACCP/GP training. ✓ SPS system design. ✓ Cooperation with CRFM.
Tobago	<ul style="list-style-type: none"> ✓ New market facilities. ✓ Introduction of the use of ice. ✓ Mandatory use of iceboxes. ✓ Fish processor adherence to HACCP. ✓ New regulations on fish and fish products
Trinidad	<ul style="list-style-type: none"> ✓ SPS infrastructure and TBT strengthened. ✓ Participation in formulation of global rules. ✓ Rationalization of roles of key institutions.
Antigua and Barbuda	<ul style="list-style-type: none"> ✓ Improvement of infrastructure. ✓ Reduction of cases of toxins. ✓ Increased consumer awareness.
Barbados	<ul style="list-style-type: none"> ✓ Steering committee from three ministries ✓ Legislation in being created ✓ Monitoring and evaluation systems ✓ Sanitation standards being created ✓ Cooperation with FAO
Belize	<ul style="list-style-type: none"> ✓ Inspection structure is in place. ✓ Written procedures in place. ✓ Inspection manuals and check lists exist. ✓ User group meetings are held regularly. ✓ Traceability system is in place - regular mock recalls practiced.
Grenada	<ul style="list-style-type: none"> ✓ HACCP implementation. ✓ Activation of protocol. ✓ Enacting legislation. ✓ Enhanced capacity for QC and inspection. ✓ Production of training material for fishermen.
Guyana	<ul style="list-style-type: none"> ✓ Training of fisherfolk - hygiene and sanitation. ✓ Landing sites are being rehabilitated. ✓ Regulations being upgraded.
Jamaica	<ul style="list-style-type: none"> ✓ Up-grading of labs. ✓ Establishment of Vet Committee Act. ✓ Testing and monitoring of harvesting and processing sites. ✓ Training of personnel in SPS.

	✓ Introduction of HACCP to all fisherfolk in export.
Suriname	✓ Approval or re-approval of all SPS establishments. ✓ Guidance documents are being developed. ✓ Legislation is being updated. ✓ Labs being upgraded. ✓ Inspection systems being certified ISO 17020. ✓ Fishing communities awareness effort.
St. Vincent and the Grenadines	✓ Upgrade of labs. ✓ Manuals for good handling practices on board being developed. ✓ SSOP manuals being created. ✓ Fish inspectors manual being created. ✓ Lab manuals (forms and logs) being created.

4.3 Assignment 2: HACCP exercises

Following the relevant lectures, participants were asked to work in groups to conduct a HACCP analysis and plan for a particular species and product in fish processing. The analysis of production processes and producers compliance with active and relevant standards in their home countries was facilitated by forms distributed to all participants (Appendix 4).

4.4 Assignment 3: Group discussion on selected statements regarding SPS

Four topics were selected for discussion in groups. Each statement was followed by a series of questions to facilitate the discussion (Appendix 5). In addition the discussion groups were asked to create a stepwise action plan towards these statements. The four statements were:

1. Monitoring and collection of data on contaminants and undesirable substances in fisheries products from wild fisheries are an important step of SPS procedures. This type of activity would benefit from a regional approach on economically important species in the Caribbean.
2. Successful SPS requires cooperation among diverse agencies within nations and across the Caribbean region. Robust SPS systems are built on various types of data that can be easily shared for purposes of monitoring and improving the system where it may be weak.
3. Comprehensive SPS systems can employ “top-down” and “bottom-up” approaches. For instance, setting rules and standards in place does not guarantee that those rules will be followed. Beyond market incentives, improving SPS conditions involves fostering an understanding on the part of primary fisheries producers and processors about general SPS requirements in fisheries and aquaculture as well as a specific understanding of regulatory requirements for US and EU markets.
4. SPS systems are based on technical and scientific expertise. Better handling and value addition activities in fisheries and aquaculture can create incentives for investment in the sector, but research and development activities are required to support investment decisions. This is an opportunity for learning institutions and the private sector to cooperate towards common aims in fisheries development.

The groups were given freedom to address these statements based on their perspectives.

Results from the discussion of statement 1 are presented in Appendix 6. The following step-wise action plan was **approved**:

1. Agree there may be technical and financial limitations in country for setting up monitoring systems.
2. Agree to the development of a project to deliver to countries a system to meet the needs of the population and the specific fisheries.
3. Build in the monitoring in a phased approach, one major fishery at a time.
4. Identify opportunities and mechanisms where country cooperation in data capture can reduce the cost and frequency of data gathering specifically for environmental monitoring.

The group working on statement 2 on data collection and sharing of data among countries did not write a step-wise action plan to implement selected activities, but addressed rather ideas to implement associated with each question (Appendix 7). It is striking that the monitoring and inspection comes under different bodies, even ministries, in different countries. Products intended for export and imported products fall under different systems to locally produced and consumed products. Large numbers of stakeholders exist in many countries, and coordination and cooperation needs to be streamlined and strengthened, both nationally and regionally.

The results of the group discussion on statement 3 on training needed to be able to address SPS issues adequately are presented in Appendix 8. A stepwise action plan for the implementation of a national training programme was prepared based on the following steps.

1. Identify the target groups.
2. Design the training program to suit the individual group (for each target group).
3. Identify the trainers and training location and other resources for the training program
4. Format the budget and identify the source of funding.
5. Communication: mobilization/ promotion/ information of the training program / information of awareness programs.
6. Conduct the trainings.
7. Monitoring of the execution of the training program (supervision).
8. Final reporting, evaluation of the effectiveness of the training and follow-up.

The final statement on research on SPS measures being conducted and by whom proved to be a difficult one. It is possible that universities and other institutions mandated to carry out research do not have much capacity to do so in food safety. It is also possible that communication and cooperation among universities, research entities and the industry need to be strengthened. It is suggested that the CRFM approaches these institutions and enters into a discussion with them on how they may improve their services to the sector.

4.5 Assignment 4: Individual plans for follow-up work on selected key topics

For the final assignment the participants were asked to reflect on four topics and identify “Specific and realistic activities/tasks”, and indicate which institution or agency should be responsible. The topics were:

1. Communication and sharing of information; nationally and regionally
2. Fostering of incentives to comply with SPS measures among stakeholders
3. Research and innovation
4. Monitoring and collection of data

In particular, participants had to identify follow-up activities and also suggest ways to measure the success of the activity, i.e. suggest suitable indicators to be used for evaluating progress after a 6 and 12 month period of time. As may be expected, some participants had clearer ideas on how to approach such

tasks, and some were reluctant in providing their views and to be held accountable for their suggestions. For that reason, the responses varied.

The results of the tasks for each theme can be summarized and categorized as follows.

1. Communication and sharing of information; nationally and regionally

Improving infrastructure

- Establish a collaboration between the Veterinary and Public Health Authorities to develop Standard Operating Procedures (SOP) for inspecting and licensing processing plants to export.

Legal support

- At the national level, establish food safety committees under the Ministry of Health or other relevant ministries to draft a legal framework for food safety regulations for both domestic market and export.
- At the regional level, CRFM will support work to develop legal instruments through an MoU with CRFM-CAHFSA-CROSQ

Capacity building

- Regionally, CRFM will develop material to convey messages of the SPS course to ministers and stakeholders attending Caribbean Week of Agriculture, incorporating best practices from the CARICOM/CARIFORUM region to build support for development of legal instruments.
- Manuals on hygiene, sanitation, cleaning, water and ice testing, HACCP, and other best practices for fish processing plants should be developed and shared.

Networking

- CRFM will establish a discussion group to facilitate sharing of best practices, lessons learned from failures, regional activity planning, national level technical exchange and activity discussion and planning. Activities of the discussion group will be tracked in numerical terms, i.e., number of exchanges on lessons and activities planned, and through an annual report documenting SPS practices, plans, and progress.
- At the national level, working groups to promote SPS through Ministries of Agriculture and Health, Fisheries, Commerce, and other related agencies should be created to share information about protocols, implementation, and monitoring.
- Best practice examples of traceability systems should be shared on a regional level.
- Reform the Codex Fisheries Group at a regional level for dissemination of Codex recommendations to fisheries governmental agencies, NGOs, and the private sector.

Web-based solutions

- Regional and national fisheries management bodies will work together to develop web-based platform for storing and sharing data on SPS.
- Documents from this training course will be disseminated at the national level, possibly through digital media, for easy access by relevant stakeholders.
- Prepare a powerpoint presentation/brochure/manual on basic hygiene practices in the fisheries sector to share through facebook or other electronic media.

2. Fostering of incentives to comply with SPS measures among stakeholders

Improving infrastructure

- Incentivize compliance with SPS measures by waiving inspection fees for businesses that pass inspection.
- Increase the number of fishers using ice to store fish at the point of capture and increase vending of ice through governmental agencies.
- Foster positive incentives for industrial, commercial vessels to comply with sanitation standards (ie, not through revoking fishing licenses).

Capacity building

- At the national level, fisheries divisions and other governmental agencies can develop and offer free-of-charge training on SPS targeting food business operators.
- At a regional level, identify SPS training needs through stakeholder discussion groups. Review available training materials, share among stakeholder discussion groups for review and customization.
- Create a public awareness campaign for primary producers on the importance of SPS using case studies and best practice examples. Form a certification system for fishers who follow SPS procedures.
- Create a manual for use in processing plants on cleaning, sanitation, and water testing.
- Develop prerequisite programme for HACCP certification to process shrimp, fish fillets, and salted and smoked fish.
- Incorporate SPS into ongoing national and regional training initiatives.

Development of markets

- Through Ministry of Industry and Commerce, establish new export markets for aquaculture farmers. Commission research on what is being produced now, and its export market potential.
- Develop value added products from raw materials and by-products through salting, smoking, fish cakes and patties, for example.

3. Research and innovation

Capacity building

- Investigate the potential to better use by-products from fisheries processing and underutilized species, including bycatch.
- Offer training on raw material handling and sanitation to primary producers.
- Governmental experts should establish cooperation agreements with universities for the development of programmes related to fisheries.

Networking

- Develop a MoU between the Fisheries Division and the Bureau of Standards on developing standards for smoked and salted fish.

Development of markets

- At a regional level, create a virtual network of interested investors and researchers for fishing industry innovation. Identify potential agencies and institutes with interest and experience in product development, innovation, and research. Identify potential investors with interest in fishing industry and by-products.
- Draft a proposal for market research nationally, and if possible, at the regional level, to be considered by CRFM, donor agencies, and partner agencies.
- Explore building an export market for conch in the EU, including mapping of the fishing ground, sampling plan, traceability systems, and other requirements for export to the EU.
- Build markets for sea cucumber as a final product, as opposed to drying/salting for further processing elsewhere, as is the case now.

4. Monitoring and collection of data

Improving infrastructure

- Accreditation of laboratory within the Fisheries Division capable of conducting the required tests as stipulated by Codex and other implementing agencies.
- Monitoring fishing grounds through cooperation with health authorities, the fishing industry, NGOs, and academia.

Networking

- Nationally, assign responsibility for the collection and distribution of data on SPS, with the Ministry of Health as the centre point.

- Establish a regional central collection point for all data related to SPS. This Regional Central Collection Point (RCCP) would be responsible for interacting with multinational agencies, such as FAO.
- Regionally, establish a MoU among CRFM/CAHFSA/CROSQ to develop a region-wide data and information sharing system for reporting and exchange of information.
- Regionally, use CRFM discussion group to facilitate sharing of best practices in monitoring and collection of data. Initially, this group should consist of participants of this course (SPS Measures in Fisheries and Aquaculture in CRFM Member States). This group will share experiences with data collection and monitoring issues and meet on an annual basis to document best practices and lessons learned.

Legal support

- At the national level, create a licensing system for artisanal vessels; use governmentally trained inspectors to collect data on a regular basis.
- Develop a traceability system, including batch numbering system and catch certification for all licensed exporters.

Data to be collected

- Collect information on socio-economic trends and livelihood data including fish landings and earnings.
- Map fishing grounds with coordinates.
- Develop a sampling schedule that accurately captures the data available on SPS elements of catch at landing sites.
- Collect data on size, meat weight, when and where caught, etc.
- Implement a programme to continuously collect production and export data for real-time monitoring. All fish and fishery-related establishments involve reporting on a monthly basis.
- Establish a web-based platform for collection of catch and traceability data.
- Include basic SPS performance indicators as part of national data collection systems. Modify data collection books and databases so basic SPS performance indicators are included.

With regard to identifying measures of success of each of the thematic issues the responses were often not clear and sometimes they did not fit well with the tasks identified. But in summary the measures are shown in Table 4.

The measures of success for the *Research and Innovation* partly lean towards seeing something new in the industry (technology or new products), and also that an institute has to take on the role to work on the R&I issues.

With regards to the *Monitoring and Collection of Data, sampling systems* (both nationally and regionally) seem to be of importance. Also clear indicators that should be monitored must be in place.

When it comes to *Fostering incentives among stakeholders to comply with SPS measures*, participants suggested some kind of preferential treatment such as lowering of fees and providing access to training. From the regional perspective an action plan is suggested along with providing access to material on SPS measures.

Finally, for a measure of success in *Communication and Sharing of Information* it is suggested that a measure could be in the form of a platform, nationally or regionally, for stakeholders. Additionally systematic training with clear criteria on what data should be collected and shared.

Table 4: Measures of success in addressing different aspects of SPS measures

Research and innovation:	Technical improvements
	New export products
	Cooperation between government and private sector
	Establishment of labs
	Publications of results
	Better utilization of species in processing
	Identification of proper institutions for R&I
	Certification and accreditation of labs
	Development of CARICOM standards
	MoUs between governments and e.g. universities
Monitoring and collection of data:	Development of systems to issue licenses
	Sampling systems established
	Establishment of SPS database with simple indicators
	Information on health indicators of products
	Develop regional system of data reporting and sharing
	Establishment of a D-group on SPS measures
	Establish a platform for stakeholders
Fostering incentives to comply with SPS measures among stakeholder:	Changes in number of registered vessels
	Changes in the number of vendors (ice and fish)
	Improvements as reported by Official inspection reporting
	SPS extension programme in national budget
	Free training to staff for complying with SPS measures
	D-group creates an action plan for stakeholders' support
	Training material available
	Preferential treatment for those who comply
	Training programmes for stakeholders
Communication and sharing of information:	Evaluation of collected data
	Sharing of reports with regional agencies
	Discussion groups
	Periodical evaluations of training and working groups
	Establishment of food safety board
	Training of staff in SPS
	Establish regular meetings and consultation
	Cross sector training
	Put SPS issues on the agenda of the CRFM Ministerial meetings
	Establishment of a web site with key SPS information
	Harmonization of data systems
	Share data through web sites
	Domestic seminars
	Establish a repository (web based) for material
	Development of SOP and implementation

5. BUDGET AND COST BREAKDOWN

The total cost of the course was about 140 000 USD which was 3% over the budget estimates as put forward in the course proposal (Table 5). Most of the cost estimates for the items were in line with actual cost, but e.g. some site visits were included in the facilities cost explaining the deviations for site visits and facilities. An unexpected cost was experienced in arranging for the participants to come to Iceland, which included special travel to acquire visas into Europe and also in some cases the selection of the participants was delayed which caused higher cost of courier services in processing for their visa. Lastly, one of the participants experienced serious illness while in Iceland and had to undergo emergency major surgery and was then hospitalized for several weeks in Iceland. The hospitalized participant needed quite a lot of support during his stay which was provided by the UNU-FTP – and explains the excessive contingency cost.

Table 5: Actual course expenses in relation to budget estimates

Item	Estimated cost (USD) in proposal	Actual cost (USD)*	Deviation (%) from estimates	Comments
Airfare	40000	40865	2%	Some of the flights became more expensive due to late bookings
Accommodation in Iceland	31200	29351	-6%	
Per diem	16800	17889	6%	
Subtotal	88000	88105	0%	
Contingency (10% of total accom + per diem)	8800	9367	6%	Unexpected cost of acquiring visa (flights and courier). Cost associated with a sudden illness of one of the participants.
Lectures	7500	8200	9%	
Work-sessions	3000	3000	0%	
Facilities	2000	3800	90%	Some site visits included here
Site visits (half day)	5950	1927	-65%	Just direct cost of site visits
Subtotal	27250	24367	-11%	
Course administrative and logistics*	20000	27247	36%	Unexpected cost in assisting participants with their travel arrangements.
Total	135250	139719	3%	

*The exchange rate to the US dollar from Iceland Central bank on 01 June 2016 as 125 IKR to 1 USD.

6. EVALUATION AND COMMENTS FROM PARTICIPANTS

6.1 Individual evaluation

The written evaluations highlighted some common themes participants seemed to find useful throughout the course. A complete list of responses is provided in Appendix 9. One of these recurring themes in the responses was the linkages in the fisheries SPS system. As one participant explained,

“Definitely my perspective on SPS has changed. Now I can understand how linked SPS measures are to the whole system of managing, producing, transporting, making sustainable and profitable business while ensuring that fishery and aquaculture products are safe both for human and animal consumption.”

There are no simple answers for implementing SPS in the Caribbean region, and this fact was clear through many of the participants’ responses. This was not intended to be a “how-to” course, but rather to open the eyes of participants to the structures and linkages underlying a successful SPS system. It aimed to sensitize participants to underlying SPS topics and open meaningful conversations in the region about how to move forward with implementing SPS.

Another common theme that emerged through the course evaluation was the impact of value addition and value chains in Icelandic fisheries, and the significant investment in developing a knowledge-based industry. As some respondents put it,

“Fisheries is a very rich and productive industry with great profitability even to the fishers.”

“The structure of the fishery product development and business development, the basis on which the fishing industry developed trained scientists especially food scientists, the recognition of the need for investment...”

Finally, when asked if they felt better prepared to implement SPS at home after participating in the course, responses varied considerably. Some respondents were hesitant to make claims about what would be possible under a vastly different set of circumstances compared to what they saw in Iceland. They identified hurdles to making the changes required for successful SPS to become a reality at home. For instance,

“I still see some doubt with some of the participants. They appear reluctant to fight, probably they feel they are not powerful enough to push such.”

“Many hurdles still exist and are difficult to overcome.”

“Approval by authorities is required for implementation.”

More often, however, respondents highlighted the confidence the course gave them to keep fighting for a successful SPS system. Associated with this was an individual sense of responsibility and resolve to work towards progress. For example,

“I have been dotted with appropriate information to implement SPS, now it is my duty to customize those tools to our national reality.”

“This program may not have strengthened the ability to implement SPS, but has certainly strengthened the resolve to get it done.”

In general, participants were satisfied with the organization, logistics, and communication during the course. In the future, however, special attention should be given to invite participants earlier to allow more time for the procurement and processing of visas.

Q: Which lecture topics did you find particularly useful (open-ended question)

Participants were asked to name lecturers and topics that were particularly useful, and some topics stand out (Table 6). Namely, many participants indicated that the lectures on leadership and empowerment were useful, as well as fish handling, and aquaculture and traceability.

Table 6: Evaluation of lectures/lecturers

Lectures	Number of participants indicating this was useful (16)
WTO/SPS/Technical barriers to trade	2
Fish handling	9
Cleaning and sanitation	3
Fishing for profits	6
HACCP theories and procedures	6
Sampling techniques	4
Empowerment and leadership	8
Buyer's requirements	4
Marketing of fish	4
Risk assessment	4
MAST, competent authority	6
Food fraud	6
Aquaculture and fish health	5
Traceability	8
Value chain analysis	2

The visit to the Fish auction and the Bylgjan fish processing seem to have appealed the most to the participants (Table 7) (see description of the companies visited in Appendix 3).

Table 7: Evaluation of site visits

Site visits	Frequency of appeal
HB Grandi	3
Ocean Cluster	4
Bylgjan fish processing plant	5
Stolt Sea Farm	2
Fish Auction	6
Fish market and landing site	3

6.2 Reflection: semi-structured group session

On the last day (April 29) the SPS group met for the last time and reflected on the experience during the two weeks. A moderator introduced the key question and made clarifications and follow-up questions to the reflection of the participants. Although not all questions are recorded in this session the “raw” responses of the participants are noted.

Q: Upon reflection, what have you seen or experienced here that you will use or put into action upon your return home?

Some examples of the "raw" responses:

- Move away from paper traceability. Lobster and conch, the systems are still in the form of paper. Gathering information from thousands of fishermen in multiple locations makes it hard to collect and trace data. Benefits are for recall: to make the products easier to follow. Maybe not web based, but electronic.
- We need more value addition. We tried with conch trimmings, and tried to sell it for chowder, but CITES counted these as part of the quota.
- Identify products that we can produce from the fish species that we already have.
- Develop a HACCP plan. Right now we are going wild...we are all over the place. We need to start small and move up from there.
- We have 2 labs (chem and microbio), we need accreditation for these labs.
- Consumers think fish on ice is spoiled. Educating our public and consumers is a key challenge for us. We have a national health and safety plan, but everyone is on their own to implement it. We need more coordination. The body is there, but it is not functioning as it is supposed to be.
- Iceland [economy] is mainly [about] fishing. In the Caribbean, fishing is a tiny part of our economy, so when you try and get attention for it, it is easy for policymakers to ignore. We have big problems in the artisanal sector with handling and icing. Educating the primary producers is important for us. We need to build a stronger relationship with the Vet and Public Health Authority (Competent Authority). Perhaps train them on fisheries SPS, or find a way to build that relationship. When they do their inspections, a fisheries staff person is

there. Processors need to give a better price for a better quality fish, they need to demand it. Consumer education.

- Cleaning and keeping records is important. We already do this, but sometimes there are lapses. Now I see the importance of using trash fish (under-utilized fish). We have a smoke room. Our plan is to use this to smoke trash fish, and to find a market for it. This will bring more income for the fishermen and they will not throw discard the fish.
- Strengthen traceability. Depth finders and using other devices. Marel was really inspirational. We have a training programme to share information about HACCP and other SPS information.
- Prerequisite programmes for those who want to put up a HACCP system: One of the problems we had was the lack of these. We want to start a project with our fisherfolk about improving the traceability system. We will run a pilot of this, and we can start almost immediately. As a government, we try to work with small business vendors (some of whom are exporting). Traceability system would help these small vendors, and if it works for them, they can increase trade. In Iceland, markets are privately owned, they are publicly owned in Barbados. Government has a responsibility to help small vendors access markets (restaurants, hotels, export).
- There is an urgency, we need histamine testing for dolphinfish and tuna. We need to train scientists to do this. I can couple this monitoring with multiple things...where the fish is coming from, traceability of where contaminated fish may be [originating]. For a long time, we have been wanting to utilize dolphinfish skin. I want to know more about how to process these skins into leather. 3,000-6,000 metric tons, Dolphinfish is about 25% of this. There is potential in using this.
- I have many new ideas after this trip, but will only be able to implement some. We don't have a system for SPS in fisheries and aquaculture products. We have for vegetables. We are now in the process of building the legislation for this, with assistance from Government of Chile. My first step is to review what has already been done. We can include this learning experience in part of our extension programmes, specifically for cleaning and sanitation at our landing sites. I am also very interested in food fraud. I didn't realize there were so many ways to identify fraudulent food, especially from importers (false documents, like origin, certification, etc). I suspect that many of the cod that comes to my country is not actually cod. We have value-added pangasus from aquaculture. They told me once that they need to find better use for skin, head, and blood. I want to facilitate communication between these farmers and researchers and entrepreneurs who can do something with the blood and other products.
- Independent labs (like Matis and MAST are separate). We are about to set up such a system (in legislation now). We have been analyzing systems from other countries (Canada, etc).
- I have been impressed with everything I have seen. How, from a CRFM standpoint, do I contribute? Our rule is an enabling rule. We need to support countries to help themselves. I want to create my own powerpoint to share the messages learned in Iceland. We have a ministerial meeting coming up soon, and there is opportunity to share these messages around the region (with a Caribbean flavour). How do we continue to network and stay in touch? We have resource/ecosystem based working groups that operate during our scientific

meetings. If countries come up with specific proposals, we can use CRFM central funds through working groups to push specific SPS issues (e.g., inter-regional consulting). Maybe build a MoU among CRFM, CA (food safety) (monitoring agency). Begin to identify agencies and institutes who are doing value addition, environmental monitoring, and food science research. Identify investors. Create a network of some kind to bring the two together for collaboration.

- Traceability. Exporters (HACCP), and catch certificates have some traceability already in place. We should make this electronic (easier to collect data on SPS). The time has come for us to strategize and be proactive on the food safety bill in the cabinet. Value addition. What to do with lobster bycatch? 2/3 of lobsters caught are being discarded at sea. The technology is there, but this waste is just a logistical problem. Regional environmental monitoring (CRFM, please) we can't afford to do this ourselves.
- MAST was interesting for me, since I am responsible for the CA in my country. Traceability is weak in our country. We have a lot of middle men (buying from fisherman) so this is where our traceability system begins. We want to trace all the way back to the boats. We will require processors to separate receiving of raw materials by boat (all licensed and registered). We need an agreement with DoF about how to deal with the artisanal sector (they do not use log books, and do not have training on how to do this).
- We will work on our capacity building. I will use the slides that were taught in training I have at home. We will start with the CA and processors. Adding value of fisheries, will be shared with the fisheries department. Project management was missing from this course. Conducting the activities is our primary challenge, as is true with all CAs. Lack of project management is a weakness in the region. (Susan: People who want to manage the projects are not the ones who should be managing them).
- 10 years ago, I would have said that this was excellent for a beginner, but now (10 years later) I see this as a refresher. Equivalence. EU guidelines. We want to see how the EU and US operate. As the Caribbean, we need to decide how we should be operating, rather than just copying. We need our own system (and prove to the EU that it can work). Food fraud. One of our biggest seafood companies exports all over the Caribbean. We have gotten complaints from the US for "excess glazing" which I didn't know was food fraud until I came here. Small producers sell to the same company, and they compile them together and distribute again (foodfraud.com, in the US, we should be using this to learn what not to do). There are too many people working at the fish markets....Iceland moves product 10 times faster than Jamaica. This is quite impressive. Traceability. FDA came to Jamaica, and checked addresses of one of the exporters (and it was an elementary school). We have a system of registration and traceability from where it is harvested to where it is distributed. Exports need to be approved by the bureau of standards.
- There are many things I learned about what is going on in the Caribbean while I was here [Iceland]. Education. Local fisherman at home. Hard people to move (get to do something correctly). I want to get in touch with people who have been here before me. I want to know where the data went that they collected. Meet with them and know what they have done. It is hard to get fishermen to go out with ice. I run a plant, and it is an eye opener to have seen what Iceland is doing in the processing. I hope I don't get transferred to another department.

7. CONCLUSIONS AND RECOMMENDATIONS

The course did not only consider SPS issues but also fisheries sector development in general. It was intensive with many new things to see and experience. The course was designed to be as practical as possible, but it also takes time for new ideas to germinate and be transformed into action. Fish is a highly perishable product and therefore infrastructure developments, like transport, water supply, electricity, etc. become much more of an issue that is often the case for agriculture. Catches often also tend to be small and heterogeneous. Therefore it is most important to focus on the more abundant and valuable species and foster regional cooperation. It is recommended that:

- Participants should try to implement their 6-12 month work plans as far as possible to ensure some applied benefits from the capacity building exercise.
- CRFM should conduct an evaluation of the performance of the 6-12 month work plans.
- CRFM should consider the recommendations regarding its role for advancing sanitary measures in fisheries and aquaculture.
- The course curriculum and delivery should be revised taking into account the findings of the evaluation exercise.

Appendix 1: SPS course proposal

Proposal

Workshop on SPS measures for fisheries professionals (public and private) in the member states of Caribbean Regional Fisheries Mechanism (CRFM) to be held in Iceland in April 2016

A consultancy report on the development of National and Regional Environmental Monitoring Programmes on SPS for fisheries and aquaculture products in the CARIFORUM states as a part of the programme “*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*” recommends a short course on SPS development guidelines for leaders in both private and public fisheries organizations/enterprises in the Caribbean.

The UNU-FTP and the CRFM have for the past decade had a formal cooperation agreement on capacity building in fisheries. Through this partnership the parties have worked closely together in development and delivery of a number of short regional courses in the Caribbean and each year the CRFM identifies fisheries professionals in the region for 6 month post-graduate training in Iceland. After entering into discussions with the UNU-FTP, the CRFM has invited the UNU-FTP to make a bid for a course on topics which address the needs of the Caribbean fisheries sector and have been highlighted in previous analyses, to be held in Iceland in April 2016.

The fisheries sector forms the backbone of the Icelandic economy. The implementation of a fisheries management system designed to promote sustainable utilization of living marine resources and maximize rent have transformed the Icelandic fishing industry. The growth and development of the industry is remarkable as it is entirely based on improved handling and utilization of the catch, innovative and largely market driven ways to add value as the total catch cannot be increased. Fishing companies have changed from being primarily suppliers of raw material to be knowledge based industries providing customers, both domestically and internationally, with high quality, safe and nutritious products.

The course proposed will focus on key aspects of SPS measures, in particular how implementation can be achieved through the development of SPS guidelines, and how proper management of marine resources, pre- and post-harvest, can maximize economic and social benefits. Twenty fisheries professionals from the private and public sectors will attend a 12 day course in Iceland focusing on how proper SPS measures can enhance food safety and quality, and how such measures may be implemented, monitored, and evaluated. Participants will also be introduced to a modern fisheries sector and highlight the development potential of fisheries in their home countries through lectures and visits to a range of fisheries companies. Participants will also share their collective experience in workgroups and assignments.

The course structure will be as follows:

- Course length is 12 days
- Held in Iceland in 17-30 April 2016
- The course will provide participants with theoretical aspects and application of SPS measures and institutional arrangements needed to maintain such a system to compete on demanding markets.
- The current situation among the Caribbean nations will be discussed and participants will reflect on their own situation in the context of their experiences and the Icelandic fishing industry.
- The course will consist of lectures, site visits to various fish processing companies and institutions, and group work.

- During visits to fish processing facilities, participants will meet production quality managers in some of the leading Icelandic fishing companies, and explore SPS measures taken along the value chain, from the fishing grounds to the consumer.
- Participant will meet key experts in the Iceland fishing industry and see how the industry is able to meet the stringent demands of the international market.
- The output of the course will be guidelines for the implementation of SPS measures for participants to take home.
- Main topics covered in lectures are:

✓ Introduction to WTO, SPS, TBT and official control	✓ Environmental monitoring	✓ Food fraud
✓ Fish safety and emerging risks	✓ Radioactive compounds	✓ Aquaculture and fish health
✓ Main microbiological risks	✓ Chemical risks and official control requirements in the EU	✓ Traceability
✓ Cleaning and sanitation	✓ Food poisoning outbreaks and epidemiology	✓ Buyer requirements
✓ Sampling techniques	✓ Risk assessment and risk communication	✓ Value chain analysis
✓ Processing water	✓ Food additives	Fisheries management
✓ Food safety management	✓ Packaging material	✓ Developing the fisheries sector

The United Nations University Fisheries Training Programme (UNU-FTP) will design, organize and implement the course in close cooperation with CRFM and Icelandic partners, including:
Matis – Icelandic food and biotech R&D institute
MAST – Icelandic Food and Veterinary Authority
Marine Research Institute
Department of Economics of the University of Iceland
The Icelandic Fishing Industry

Budget:

Item	Unit price (USD)	Quantity	Cost (USD)	Comments
Airfare	2,000	20	40,000	
Accommodation in Iceland	120	260	31,200	
Per diem	60	280	16,800	
Subtotal			88,000	
Contingency (10% of total accom + per diem)			8,800	
Lectures	250	30	7500	
Work-sessions	100	30	3000	
Facilities	200	10	2000	
Site visits (half day)	850	7	5950	
Subtotal			27250	
Course Administration and logistics*			20000	
Total			135,250	

**includes two full time staff of the UNU-FTP during the course and logistics in Iceland*

The United Nations University – Fisheries Training Programme was established in Iceland in 1998 and is a cooperative programme among research institutes and universities in Iceland, led by the Marine Research Institute and is part of the UNU. The main goal of the programme is to assist partner countries in formulating and achieving their developmental goals in fisheries through training and policy relevant research. It offers 6 month post-graduate training for practicing professionals in fisheries who specialize in different areas of fisheries. So far over 300 fellows from about 50 countries have completed this training, most of them specializing in Quality Management of Fish Handling and Processing. Since 2004 the UNU-FTP has together with regional, international and national organizations in partner countries developed and delivered 35 short courses in partner countries taken by over 1000 participants. Further information about the programme can be found on the website of the programme: <http://www.unuftp.is/>

Appendix 2: Terms of Reference

10th EDF Programme titled “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”.

TERMS OF REFERENCE

CONSULTANT SERVICES – CAPACITY BUILDING FOR FISHERIES PROFESSIONALS IN SPS MEASURES AND THE INSTITUTIONAL ARRANGEMENTS REQUIRED FOR OPTIMIZED PERFORMANCE OF THE SECTOR

1.0 INTRODUCTION

The continued viability and further development of the fishing industry of the CRFM region faces several challenges, some of which are related to inadequate development of SPS systems to suit the specific needs of fisheries and aquaculture operations. Of particular importance to note are:

- barriers in trade of fish and fisheries products due to inadequate SPS standards;
- concern about food security and decreasing usage of local, fresh seafood, the solution for which improved SPS support is an essential component;
- impacts of global environmental changes including climate change, for which improved management and monitoring of the natural environment sustaining fisheries and aquaculture production must play a vital part.

The Caribbean Community Common Fisheries Policy includes several provisions addressing SPS in fisheries including 3 of the 9 objectives (Article 4.3(b) (g) and (i)), and Article 18 on Marketing and Trade.

Towards addressing the challenges noted, CRFM’s Strategic Plan for the period 2013 - 2021 enunciated the need for SPS requirements to be met. It should be noted that under the CRFM Strategic Plan for 2013 - 2021, SPS requirements are addressed under the Strategic Objective, ‘Sustainable Management and Use of Fisheries Resources’.

The programme on Sanitary and Phyto-Sanitary Measures (SPS) is one component of the 10th EDF Programme titled “Support to the Forum of Caribbean States in the implementation of the commitments undertaken under the Economic Partnership Agreement (EPA)”, with the fisheries sub-component being coordinated by the CRFM.

The Inter-American Institute for Cooperation on Agriculture (IICA), the implementing agency for the 10th EDF Sanitary and Phytosanitary (SPS) Measures Project, on behalf of the CRFM, is seeking to build the capacity of Fisheries Professionals in SPS measures and the institutional arrangements required for

optimized performance of the sector, and in so doing, support implementation of SPS measures and contribute to increased trade opportunities in CARIFORUM countries.

The overall objective of the 10th EDF Programme is to support the beneficial integration of the CARIFORUM states into the world economy and the overall objective of the SPS programme is to facilitate CARIFORUM States to gain and improve market access by complying with Europe's Sanitary and Phytosanitary (SPS) measures, and to help CARIFORUM states to better develop their own regionally harmonized SPS measures. The specific objective of the SPS programme is to increase production and trade in agriculture and fisheries which meet international standards while protecting plant, animal and human health and the environment. The Action, listed below, is directed towards creating and/or strengthening Regional and National SPS systems through systematic focus on:

Legislation, protocols, standards, measures and guidelines in the area of AHFS and fisheries for national and regional SPS regimes: to enhance CARIFORUM Agricultural Health and Food Safety (AHFS) efforts and strengthen enforcement of protocols, standards, measures and guidelines for increased production and marketing in agriculture and fisheries.

National and regional coordination mechanisms in the support of the SPS regime: to support implementation of the SPS measures in the CARIFORUM member states.

National and regional regulatory and industry capacity to meet the SPS requirements of international trade: to support and enhance the institutional capacity of national and/or regional regulatory bodies and industry in the agriculture sector, including the fisheries subsector, to meet the SPS requirements of international trade.

The project is being implemented in collaboration with the following partners: CARICOM Secretariat (CCS), Caribbean Regional Fisheries Mechanism (CRFM) and the SPS committee of the Dominican Republic (Comite Nacional para la Aplicacion de Medidas Sanitarias y Fitosanitarias – (CNMSF). The CARIFORUM States are the primary beneficiaries of the project activities.

2.0 THE CONTRACTOR: United Nations University – Fisheries Training Programme (UNU-FTP)

3.0 OBJECTIVE

To build the capacity of Fisheries Professionals in SPS measures and the institutional arrangements required for optimized performance of the sector, and in so doing, support implementation of SPS measures and contribute to increased trade opportunities in CARIFORUM countries.

4.0 SCOPE OF WORK

The CONTRACTOR will work under the general direction of the 10th EDF SPS Project Management Team (Manager and International Agricultural Health and Food Safety Specialist) and the CRFM Secretariat.

The scope of work covers all activities necessary to accomplish the Expected Results stated. The main tasks/activities are as follows.

- i. Attend an initial virtual briefing meeting with the Project Management Team and the CRFM Secretariat to discuss the objectives, activities, approach, expected outputs and any other issues related to the execution of the assignment that require clarification.
- ii. Within **ten (10) days** of the briefing meeting, THE CONTRACTOR will prepare a detailed course syllabus and work plan suitable for a CARIFORUM audience, clearly identifying the specific course objectives, content including titles of lectures and learning outcomes, activities, and timetable for the execution of the capacity building action.
- iii. The main capacity building action will include the following:
 - a. *Prepare the course syllabus and workplan.* This should clearly identify the course objectives, content, activities, and timetable for the execution of the capacity building action, and the syllabus should be suitable for a CARIFORUM audience. The course should focus on: key aspects of SPS measures, such as environmental monitoring, cleaning and sanitation, traceability, value chain analysis, risk assessment; the development of SPS guidelines, and; institutional arrangements for proper management of marine resources and for fulfilling the development potential of the fisheries and aquaculture sector in CARIFORUM countries to maximize the economic and social benefits.
 - b. *Using the proposed course syllabus and workplan, prepare materials for the training course.* The training course should feature lectures, workgroups, assignments, and visits to a range of fisheries companies, and delivered in a manner to promote full interaction and participation. The training materials developed should be compliant with international standards and aligned to the industry needs of CARIFORUM Countries.
 - c. *Makes arrangements for transport and accommodation of course participants, and deliver training course.* Arrangements are to be made to transport, accommodate, and host a minimum of twenty fisheries professionals from among the CARIFORUM countries. Arrangements are to be made also to deliver the training at a suitable venue in Iceland.
 - d. *Design and Implement a Course Evaluation Tool.* An evaluation of the course should be conducted to take into account (but not limited to): the usefulness of the information provided, the knowledge and skills acquired, quality of delivery, suitability of arrangements such as travel, accommodation and venue, etc. Factors impacting the sustainability of the action should also be identified and recommendations made on corrective actions that should be taken to ensure that attainment of goal.
 - e. *Design a Monitoring and Evaluation Tool for the post-training period for use by the CRFM.* Additionally, a monitoring and evaluation tool for measuring the medium-long term (6 months to 2 years) impact of the course should also be developed to take account of (but not limited to): the application of the information, knowledge, and skills acquired, improvements in efficiency and compliance with SPS regime by the countries and institutions concerned, etc..
- iv. At the end of the capacity building action, a debriefing meeting will be held with the Project Management Team and the CRFM Secretariat. The report of the capacity building action will form the basis for the discussions.

5.0 EXPECTED RESULTS

The Assignment to execute capacity building action for fisheries professionals in all fifteen CARIFORUM countries:

- CARIFORUM-customized fisheries SPS Measures Training Course developed, delivered and evaluated to support capacity building in fisheries-related SPS measures and institutional arrangements required to for optimized performance of the fisheries and aquaculture sector.
- A minimum of twenty fisheries professionals responsible for SPS management trained in SPS measures and institutional arrangements required for optimized performance of the fisheries and aquaculture sector.

6.0 DELIVERABLES

- A SPS Measures Training Course Syllabus, Workplan, suited for a CARIFORUM audience.
- Development, delivery and compilation of the training materials for the SPS Measures Training Course (lecture files and/or notes, training materials to support practical/field sessions, materials to support group work, etc).
- Training course evaluation tool and also post-training monitoring and evaluation tool.
- A report of the implementation of the capacity building action (SPS Measures Training Course), including an evaluation of the course content, delivery, and course delivery arrangements. The training material mentioned at bullet 2 should also be submitted as an appendix to this report.

7.0 ROLES AND RESPONSIBILITIES

The CONTRACTOR is responsible for execution of the main capacity building ACTION and accomplishing the Expected Results and Deliverables as outlined above. Additionally, the CONTRACTOR will provide the following assistance:

- Manage trainee travel including arrangements for accommodations and per diem
- Identifying and securing appropriate training locations

The CONTRACTING PARTY, through its Project Management Unit, IICA office, Barbados, and in collaboration with the CRFM Secretariat, will provide the following assistance to the CONTRACTOR in a timely manner:

- Facilitate trainee recruitment

8.0 REPORTING

- The CONTRACTOR will prepare a training course syllabus, work plan, course materials and a final capacity building action report.
- The course syllabus and work plan will be submitted within 10 days of the briefing meeting.
- The final report should include methodologies used to deliver the various outputs, with lessons learned and recommendations for follow up action, as well as the contract deliverables noted at section 6 that should be included as appendices.
- The report should be produced in Microsoft Word for Windows format and submitted electronically to the CRFM Secretariat and the PMU by the end of the contract period.

9.0 LOGISTICS

The CONTRACTOR will be responsible for all logistics associated with the assignment.

10.0 DURATION

The assignment will commence on the day on which it is signed and shall expire on June 30, 2016, with the option to extend up to an additional month upon mutual agreement.

11.0 REQUIRED EXPERIENCE

- At least ten (10) years' experience conducting capacity building actions internationally;
- Specific experience in application of SPS measures and development of industry potential for the fisheries and aquaculture sector
- Proven experience working with fisheries professionals;
- Proven experience in the development and implementation of training programmes for the fisheries and aquaculture sector.

12.0 PAYMENT SCHEDULE

A First Payment of 15% of the total fees of One Hundred and Thirty-Five Thousand, Two Hundred and Fifty United States Dollars (USD135,250) United States Dollars equivalent to Twenty Thousand, Two Hundred and Eighty-Eight United States Dollars (USD20,288), upon receipt and approval by IICA, a SPS Measures Training Course Syllabus, Workplan, suited for a CARIFORUM audience.

A Second Payment of 50% of the total fees of One Hundred and Thirty-Five Thousand, Two Hundred and Fifty United States Dollars (USD135,250) United States Dollars equivalent to Sixty-Seven, Six Hundred and Twenty-Five United States Dollars (USD67,625), upon and receipt and approval by IICA of the training materials for the SPS Measures Training Course and the course evaluation tool.

A Third Payment 35% the total fees of the total fees of One Hundred and Thirty-Five Thousand, Two Hundred and Fifty United States Dollars (USD135,250) United States Dollars equivalent to Forty-Seven Thousand, Three Hundred and Thirty-Seven United States Dollars (USD47,337), upon the delivery of the training workshop and the submission and approval by IICA of a final report of the action.

Appendix 3: Companies and institutions visited and points for course participants to consider during visits

Marine Research Institute

http://www.hafro.is/undir_eng.php?ID=1&REF=1

The Marine Research Institute (MRI), established in 1965, is a government institute under the auspices of the Ministry of Industry and Innovation. MRI conducts various marine research activities and provides the Ministry with scientific advice based on its research on marine resources and the environment. The institute has around 130 employees, 2 research vessels, 5 branches around Iceland and a mariculture laboratory.

The three main areas of activities of the MRI are the following:

- to conduct research on the marine environment around Iceland and its living resources
- to provide advice to the government on catch levels and conservation measures
- to inform the government, the fishery sector and the public about the sea and its living resources

Points to consider:

- What is the role of science in the fisheries industry in Iceland?
- How does research about fisheries stocks and the marine environment impact decisions on how to use marine resources?
- What led Iceland to adopt the individual transferable quota system?
- What are the positive and negative elements of the ITQ system?

Matis Ltd.

<http://www.matis.is/english>

Matís Ltd. is a government owned, independent research company with the vision to increase the value of food processing and food production, through research, development, dissemination of knowledge and consultancy, as well as to ensure the safety and quality of food and feed products. To this end, Matís pursues research and development aligned to the food and biotechnology industries as well as providing Iceland's leading analytical testing service for public and private authorities. Matís specializes in biotechnology, enzyme isolation, processing technology, traceability, genetic analysis, chemical and microbiological testing, physical and chemical properties of food, quality and safety of aquatic and marine catches, feed technology for aquaculture and environmental research.

Points to consider:

- ✓ What is the relationship between Matís and the fishing industry?
- ✓ What are the common goals between Matís and academia?
- ✓ What role does Matís play in the SPS system of Iceland?

Marel

<http://marel.com/fish-processing>

Marel is the leading global supplier of advanced standalone equipment and integrated systems to the fish industry. With roots in the fish industry all the way back to the company's origins developing onboard scales, Marel combines its extensive knowledge of fish processing with heavy investment in product development to create innovative equipment, systems, and software for processing whitefish and salmon, both farmed and wild, onboard and ashore.

Points to consider:

- ✓ How does Marel incorporate SPS into the design of its processing machines?
- ✓ How do processing companies make the decision to invest in high tech processing equipment like the machines designed and built at Marel?
- ✓ What role do research and innovation play in Marel's business model?

Fish Auction Market

<http://www.fmis.is/english>

Fiskmarkadur Islands (FMIS) is Iceland's biggest fish market with approximately a 50% share of all sold quantity on Icelandic fish markets. The company operates in nine locations throughout the country. The bulk of the catch sold through FMIS comes from smaller fishing boats and the daily catch is usually sold before unloading. Thus the freshness and quality of the fish is high. In landing, it is ensured that the fish is properly iced and placed in insulated fish tubs; furthermore the fish temperature is measured and recorded.

After unloading, the fish is sorted into size categories and weighed, then iced again. Auctions take place at 13:00 every business day using an internet based auction system that allows buyers to submit bids from any location. The auction is administered by a central auctioning system operated by the [Iceland Fish Markets' Data Center](#). After the auction, the fish is available to the buyers' transporter and usually forwarded the same night it is caught.

Points to consider:

- ✓ How is information entered into the auction system?
- ✓ Who decided the price of fish sold from Iceland?
- ✓ How is data on fish sales used for development of markets?
- ✓ What role does this system play in fostering SPS?

Stolt Sea Farm

<http://www.stolt-nielsen.com/Stolt-Sea-Farm.aspx>

Stolt Sea Farm is one of the world's most advanced high-tech aquaculture companies. We specialize in the production of high quality turbot, sole, sturgeon and caviar. We are proud to produce healthy foods in an environmentally sound manner.

The successful farming of the premium species we produce requires extensive scientific knowhow, sophisticated technology and highly specialized custom-designed facilities. To achieve our goals, we engage in a process of continuous improvement, driven by substantial ongoing investments in research and development. Since the founding of Stolt Sea Farm in 1972, we have dedicated ourselves to the advancement of aquaculture as an environmentally sustainable source of healthy food.

Points to consider:

- ✓ How is quality measured at Stolt?
- ✓ What is the process for quality inspection and certification?
- ✓ What legal frameworks are in place that regulates the quality of fish produced by Stolt?
- ✓ What are the market incentives to ensure quality and SPS measures are done correctly at the farm?

MAST: Icelandic Food and Veterinary Authority

<http://www.mast.is/english/frontpage/about-mast/>

The Icelandic Food and Veterinary Authority (MAST) is an inspection and administrative body and the Competent Authority (CA) in Iceland in the field of food safety, animal health and welfare, control of feed, seed and fertilizers, plant health and water for human consumption. The Authority is responsible to the Ministry of Industries and Innovation and its primary roles are:

- Food safety legislation and control
- Control of primary production of animal products, including fish and fish products
- Control of meat processing and dairy plants
- Import and export control of all foodstuffs
- Supervision of domestic food control by municipal authorities

- Animal health and welfare legislation and control
- Plant protection services
- Feed, seed and fertilizer services
- Meat classification services

Administration and management

The Icelandic Food and Veterinary Authority's role is to promote the health and welfare of animals, plant health and the safety and quality of food by enforcing legislation and providing education and services to the fisheries and agricultural sectors, businesses and consumers.

Points to consider:

- ✓ What is the process of quality inspection used by MAST?
- ✓ What recourse is taken if infractions are found?

Appendix 4: Worksheets for designing HACCP systems in fish processing.

Hazard Analysis Worksheet

[illegible]

Firm name: _____

HACCP Plan Form

Product: _____

Critical Control point	Significant Hazard	Critical Limits for each Control Measure	Monitoring				Corrective Actions	
			What	How	Frequency	Who		

Appendix 5: Statements and questions to guide group discussions

1. Monitoring and collection of data on contaminants and undesirable substances in fisheries products from wild fisheries are an important step of SPS procedures. This type of activity would benefit from a regional approach on economically important species in the Caribbean.
 - a. What systems for collecting SPS information are in place at the national level?
 - b. What systems supporting the management and use of data and information on SPS exist at a national level?
 - c. What data collection measures are being taken at a national level that could be applicable at a regional level?
 - d. Describe the current usage of data and information to promote SPS awareness in the general public. How would you overcome barriers to doing this successfully?
 - e. What regional coordination mechanisms are in place upon which such a data gathering and sharing system could be built?
 - f. What are the barriers to regional cooperation of this nature?
 - g. What type of data would be important to collect?
 - h. How often would collection need to occur?
 - i. What is the best way to divide responsibilities among agencies at the national and regional level when it comes to collecting and analysing information?
 - j. How can data and information be financed sustainably by your own funds?
 - k. What steps could be taken to harmonise data collection?
2. Successful SPS requires cooperation among diverse agencies within nations and across the Caribbean region. Robust SPS systems are built on various types of data that can be easily shared for purposes of monitoring and improving the system where it may be weak.
 - a. Discuss the various types of data that need to be collected to ensure comprehensive SPS measures are in place in fisheries.
 - b. Which agencies are responsible for collecting the various types of information that could be important to SPS management at a national level?
 - c. What systems are already in place at the national level for coordination among such agencies?
 - d. What mechanisms are in place for national interagency cooperation?
 - e. What are the barriers to sharing data at a national level?
 - f. What ideas do you have for how these barriers can be overcome?
 - g. How could technology be used to aid in the sharing of information within and among countries?
3. Comprehensive SPS systems can employ “top-down” and “bottom-up” approaches. For instance, setting rules and standards in place does not guarantee that those rules will be followed. Beyond market incentives, improving SPS conditions involves fostering an understanding on the part of primary fisheries producers and processors about general SPS requirements in fisheries and aquaculture as well as a specific understanding of regulatory requirements for US and EU markets.
 - a. What training programmes are already in place for primary producers and processors in fisheries sector on SPS at a national level? Regional?
 - b. (Skills level of primary producers? Special consideration when designing training for this target group?)
 - c. Are there examples of successful training programmes on similar topics targeting primary producers in fisheries?

- d. What are the potential barriers to designing and implementing such a training programme?
 - e. There are many institutions that provide training, but not all training is effective and applicable. What makes training effective?
 - f. What are the possible sources of funding to support such SPS training?
4. SPS systems are based on technical and scientific expertise. Better handling and value addition activities in fisheries and aquaculture can create incentives for investment in the sector, but research and development activities are required to support investment decisions. This is an opportunity for learning institutions and the private sector to cooperate towards common aims in fisheries development.
- a. What academic training exists now on fisheries in the Caribbean?
 - b. How could academic institutions work to improve education of technical and research professionals to support the implementation of SPS measures?
 - c. What are the common goals of academics and the fisheries industry in the Caribbean?
 - d. How could the academic world and the fisheries sector work together to achieve these goals?

Appendix 6: Outputs from group discussion on data collection and communication

Monitoring and collection of data on contaminants and undesirable substances in fisheries products from wild fisheries are an important step of SPS procedures. These type of activities would benefit from a regional approach on economically important species in the Caribbean.

a. What systems for collecting SPS information are in place at the national level?

ANTIGUA & BARBUDA

There is no monitoring system developed for environmental monitoring of the marine ecosystem but the Ministry of Health and Fisheries Division conduct some environmental checks.

BAHAMAS

Monitoring is conducted by the Ministry of Health, e.g. food outbreaks (i.e. *Vibrio* in conch) Department of Fisheries has a Monitoring and Verification Programme for processed seafood.

BARBADOS

Monitoring of the marine environment conducted by the Environmental Protection Department, but not specifically for SPS data. The Ministry of Health and Ministry of Agriculture do monitoring of fishery products as food.

b. What systems supporting the management and use of data and information on SPS exist at the national level?

In general, there is no formal system supporting the above in Antigua & Barbuda. In the Bahamas, the Department of Public health monitors and manages SPS information at the health system level. In Barbados a Monitoring and Evaluation System for SPS activities has been developed for the Agricultural Health and Food Control System.

c. What data collection measures are being taken at a national level that could be applicable at a regional level?

The Monitoring and Evaluation of SPS performance as exemplified by Barbados is applicable to the Region

d. Describe the current usage of data and information to promote SPS awareness in the general public. How would you overcome barriers to doing this successfully?

Sensitization on food safety hazards is done through training conducted for fish handlers and food handlers and public service announcements when there are urgent events.

e. What regional coordination mechanisms are in place upon which such a data gathering and sharing system could be built?

Caribbean Agricultural Health and Food Safety Agency (CAHFSA), CARICOM Regional Organization on Standards and Quality (CROSQ) are SPS FOCAL POINTS and the Caribbean Regional Fisheries Mechanism: these are the existing regional organizations. The national organizations of agricultural health and food safety are the foundation of data gathering, and not the other way around, i.e. BAHA, NAHFCA (Barbados), BAHFSA (Bahamas) being developed.

f. What are the barriers to regional cooperation of this nature?

CAHFSA is a relatively new organization. CROSQ

Lack of regional technical working groups i.e. like the Veterinary group.

Different country priorities, unrelated disputes.

g. What type of data would be important to collect?

Environmental (e.g. heavy metals), Fishery product hazards and process related hazards should be included. Food (fish) borne illness outbreaks. Fish consumption patterns.

h. How often would collection have to occur?

It depends on the findings of your baseline information, if contaminants & hazards are well below safety levels, less frequent than if problems occur.

i. What is the best way to divide responsibilities among agencies at the national and regional level when it comes to collecting and analyzing information?

Each country will decide at the national level the Agencies (competent authority) responsible for data collection and monitoring. The regional agency could perform the collation and analytical work.

j. How can data and information be financed sustainably by your own funds?

Even though License fees, user fees, export taxes may be opportunities; these funds are collected in most cases by central governments' consolidated fund and not directly accessible. Also this revenue realistically would not be a sufficient source of funds for tasks envisaged.

k. What steps could be taken to harmonize data collection?

1. Determine what is currently been done
2. Implement program of countries with no monitoring catching up to those which do
3. Determine regional baselines
4. Prepare environmental map of info collected
5. Determine required monitoring frequency based on data received
6. On-going program of monitoring

This would require discussion among similar fisheries stakeholder countries but in general, expertise in the defining and setting up of these systems is required for the region.

STEPWISE ACTIONS TO ADDRESS ABOVE ISSUES

1. Agree there may be technical and financial limitations in country for setting up monitoring systems.
2. Agree to the development of a project to deliver to countries a system to meet the needs of the population and the specific fisheries
3. Build out the monitoring in a phased approach, one major fishery at a time?
4. Identify opportunities & mechanisms where country cooperation in data capture can reduce the cost and frequency of data gathering specifically for environmental monitoring

An example will now be used for Barbados to illustrate possible monitoring and collection of data on contaminants and undesirable substances in fisheries products from wild fisheries.

- Target Fishery: Large pelagic fishery – dolphinfish and/or tuna
- Parameters- histamine, mercury
- Method: Histamine – use of internationally recognized field kits.
- Validation method – Main food laboratory scientist received training in HPLC method in Ireland under this SPS project. Capacity building and testing ongoing.
- Corresponding activities: Use current data collection/trip interview activities to build out traceability system from sea (fishing zone), selling to final processing.

- Strengthen environmental monitoring through networking with other agencies and local university.
- The data collected will contribute to the baseline of the Monitoring & Evaluation system of the NAHFCA system.

Appendix 7: Outputs from group discussion on data sharing in the implementation of SPS measures

1. The implementation of an effective SPS system is significantly dependent on data collection and the agencies which collect the data.

There are various types of data which need to be collected for the effective implementation of the system. These include but not limited to:

- Catch data - this can be divided into domestic usage and export quantity.
 - Data pertaining to health related issues e.g. illness and in extreme circumstances death.
 - Socioeconomic/livelihood data which gives an indication of the value of the fisheries sector.
 - Collection of microbiological test data.
 - Fishers and traders data including number of registered fishers and licensed fish traders.
 - Certified food handlers permit (processing plant, fisher folk etc) issued by the Ministry of Health.
 - Environmental data.
 - Data related to Invasive species and their impact e.g. lionfish.
2. Within most countries in the region there are two primary agencies that are responsible for the coordination and implementation of the SPS system, these agencies usually falls under Ministries such as Health, Agriculture, Commerce, Environment, Trade and Industry.
 - The Ministry of Health has the responsibility for the implementation of SPS measures in the local industry, markets, supermarkets/ retailers/ shops and restaurants.
 - The Ministry of Agriculture, Fisheries and Forestry has the responsibility for SPS with regards to regional and international markets which include imports and exports.
 - i. Other institutions includes :
 - Bureau of Standards
 - National Environmental and Planning Agency
 - Research Universities/ Colleges
 - Co-operatives
 - Plant Protection departments
 - Private Sector Stakeholders (FBO)
 - Pesticide Authority (PA)
 - The National Enquiry Point and Notification Authority on SPS
 3. The SPS system relies on the coordinated effort of the above mentioned institutions. To facilitate this coordination process, special committees such as the National Food Safety Organization, National Fisheries Sub-Committee, National Fisher Folk Organization, Local Fisherman's Cooperatives, National Codex Committee and National Agricultural Health and Food Safety Coordinating Committee are developed.
 4. The types of mechanisms that have been established to foster national inter-agency cooperation include: hosting meetings, seminars, workshop, conferences, establishment of working groups and the development and maintenance of a National Food Safety Information System.
 5. The barriers which exist at the national level which are hindering the sharing of data include:
 - Timely update of legislations as appropriate - Current SPS legislation is inadequate, overlapping, inconsistent, and not equivalent to international norms.

- Law making process is time consuming and not responsive to reality requirements
 - Inter-agency disagreements - For instance, various government organizations may share responsibilities for SPS management with overlapping mandates, which creates confusion, infighting and impedes coordination
 - Clarify organizational mandates and roles of them in SPS
 - Client confidentiality – we are currently been ordered not to share clients data.
 - Lack of human resource regarding competency and data gathering
 - Lack of finance and technical capacity.
 - Lack of expertise and resources to participate in international standard setting committee e.g. Codex Committee
 - Food processing businesses are mainly of small and medium scale without adequate investment, and limited resources and capacity to undertake advanced hygiene practices.
 - The involvement of private sector in SPS issues is limited.
6. In order to overcome these barriers there must be:
- better coordination among agencies
 - budgetary allocation
 - improvement of legislative framework to enable the sharing and gathering of data
 - mechanisms to involve regional and international agencies/ organization, such as CaribVet (Caribbean Animal Network)
 - decreasing bureaucracy
 - Training
 - political will
 - Make food safety a priority
7. Within and among the Caribbean region technology can aid in the sharing of information through:
- Establishment of more regional organization and network, such as CaribVet, CAISNet.
 - harmonization of data gathering system,
 - standardization of health certificates and
 - the establishment of a Regional Food Safety Emergency Response System (e.g. EU Rapid Alert System for Feed and Food) and
 - National Food Safety Information System
 - National Phytosanitary Database
 - National Information System for Animal Health through the OIE

DISCUSSION

Reflecting on our regional experience and in comparison with what we have seen in Iceland over the past few days.

- It can be deduced that there is a common legislative framework within the EU region and EEA Iceland. Further to that, it seems that there is a high level of enforcement and compliance with food safety laws as opposed to a lot of the islands in the Caribbean.
- Significant emphasis is being placed on getting processing establishments properly certified to meet international health and safety standards. Whereas in the Caribbean safety standards are sometimes being viewed as trade barriers.
- In Iceland significant importance is also placed on the value and value chain in the fishing industry.
- There is in existence a Rapid Alert System

Appendix 8: Outputs from group discussion on skills development and training

Comprehensive SPS systems can employ “top-down” and “bottom-up” approaches. For instance, setting rules and standards in place does not guarantee that those rules will be followed. Beyond market incentives, improving SPS conditions involves fostering an understanding on the part of primary fisheries producers and processors about general SPS requirements in fisheries and aquaculture as well as a specific understanding of regulatory requirements for US and EU markets.

INTRODUCTION/ Background information

Primary producers are:

1. Fisherfolk
2. Fishing vessels
3. Ice plants/producers
4. Builders of ice plants/holdings and distribution
5. Fish markets

Processors: processing facilities

TRAINING PROGRAM for:

Primary producers:

1. Catching area: training/ information to fishermen about approved catching area...e.g. ciguatera issue
2. Fishing vessels: training for the builders regarding requirements food safety like construction, choice of materials/ avoiding of cross contamination by bilge water or human offal/ waste.
3. Ice plants/producers: training in requirements regarding ice, hygiene, water management
4. Builders of ice plants/holdings and distribution: training in requirements regarding construction, hygiene e.g.
5. Fisherfolk:
 - Fresh on ice: training in fish handling on board (Good Hygiene practices, GMP, Good storage practices)
 - Frozen: training in HACCP (mandatory)

Processors:

- **National:**
 - Training of personnel in prerequisite programs and HACCP (risk assessment, CCP's e.g.)
 - Training of HACCP team in legislation and standards regarding food safety in fishery products (national, regional, international)
- **Regional:**
 - Exchange programs: communication, harmonization of standards and legislation
 - Establishment of E-working groups

! Note:

- Comprehensive SPS systems can employ “**top-down**” and “**bottom-up**” approaches.
It is also important that in the training program other actors must also be trained in SPS requirements, to fulfill their role in this system regarding the whole food chain of the processing of fishery products!!!
 1. Personnel of the Competent Authority (CA): training and refreshment training of employees responsible for performing official controls.
 2. Personnel of other collaborating organization (e.g. customs, coast guard and other Ministries) who are in a way involved in the whole food chain of fishery products.
 3. The local community/ consumers: trained via communication medium e.g. (infomercials/ awareness programs) in how to handle fish and overall quality aspects regarding food safety.
-

Questions and outcome:

a. Training program already in place

- **Primary producer:** in Belize (Segregation of foodstuff/ GMP, GHP, Good Storage Practices),
- **Processor:** in Suriname (Quality Assurance in Fisheries: quality assurance, prerequisite programs, HACCP, legal framework, organization/ business management, specific subjects about fish species identification, -spoilage, -chemical structure and composition e.g.)

b. Skills level of primary producers

- **Fishermen (artisanal):** Language, visual aids, simple drawing's/ posters
- **Industry (captain fishing vessels, quality manager etc.):** know-how of national and international legislation, standards and HACCP.

c. Examples of successful training programs targeting primary producers

- **Primary producer:** in Belize (Segregation of foodstuff/ GMP, GHP, GSP)
- **Processor:** in Suriname (Quality Assurance in Fisheries: quality assurance, prerequisite programs, HACCP, legal framework, organization/ business management, specific subjects about fish)

d. Potential barriers

Lack of finance, language, lack of interest, timing of the training, geographical distance, adequate training facilities, the availability of qualified trainers.

e. Effectiveness of the training

- Training program specific for the target group (according to their educational level)
- People must be motivated and willing to learn.
- Evaluation and follow up of the program
- Good (qualified) and motivational trainer who has much experience regarding the subject

f. Possible sources of funding to support

- Funding agencies abroad
- Fishery industry
- Government

Summary of stepwise actions:

1. Identify the target groups
2. Design the training program to suit the individual group (for each target group)
3. Identify the trainers and training location and other resources for the training program
4. Format the budget and identify the source of funding
5. Communication: mobilization/ promotion/ information of the training program / information or awareness programs
6. Conduct the trainings
7. Monitoring of the execution of the training program
8. Final reporting, evaluation of the effectiveness of the training and follow up

Action Plan

Stepwise actions for implementing a national training program:

1. Identify the target groups
2. Design the training program to suit the individual group (for each target group)
3. Identify the trainers and training location and other resources for the training program
4. Format the budget and identify the source of funding
5. Communication: mobilization/ promotion/ information of the training program / information of awareness programs
6. Conduct the trainings
7. Monitoring of the execution of the training program (supervision)
8. Final reporting, evaluation of the effectiveness of the training and follow up.

SKILLS DEVELOPMENT AND TRAINING																			
		Responsible person	Deadline	Execution period (June 2016 up to June 2017)												Evaluation			Expected output
				2016						2017						Realization			
				jun	jul	aug	sep	nov	dec	jan	feb	mar	apr	may	jun	Yes	No	Ongoing	
1	Action:																		
	Identify the target groups																		Target groups are identified (primary production/ processors)
	Activities:																		
	1. Identify the gap in knowledge/ skills in quality/ food safety aspects regarding fishery products (problem analysis food safety issues)	Working group												x					
	2. Specify the target groups to be trained	Working group												x					
2	Action:																		Suitable training program for each target group is designed
	Design the training program to suit the individual group (for each target group)																		
	Activities:																		
	1. Training program for primary producers																		
	2. Training program for processors																		
	3. Training program for CA																		
	4. Training program for local community/ consumers																		
5. Training program for collaborating organizations																			
3	Action:																		
	Identify the trainers and training location and other resources																		
	Activities:																		
	1. Identify trainers																		
	2. Identify training location and other resources																		
4	Action:																		
	Format the budget and identify the source of funding																		
	Activities:																		

SKILLS DEVELOPMENT AND TRAINING																			
		Responsible person	Deadline	Execution period (June 2016 up to June 2017)												Evaluation			Expected output
				2016						2017						Realization			
				jun	jul	aug	sep	nov	dec	jan	feb	mar	apr	may	jun	Yes	No	Ongoing	
5	<u>Action:</u>																		
	Communication: mobilization/ promotion/ information of the training program/ information of awareness programs																		
	Activities:																		
6	<u>Action:</u>																		
	Conduct the trainings																		
	Activities:																		
	1. Training program for primary producers																		
	2. Training program for processors																		
	3. Training program for CA																		
	4. Training program for local community/ consumers: -Infomercials shown onTV or placed on the radio - Brochures published and circulated	xxx																	
5. Training program for collaborating organizations	yyy																		
7	<u>Action:</u>																		
	Monitoring the execution of the training program(supervision)																		
	Activities:																		
8	<u>Action:</u>																		
	Final reporting, evaluation of the effectiveness of the training and follow-up																		Target groups implement what they have learned
	Activities:																		
	1. Final report																		
	2. Evaluation of the effectiveness of the training																		
	3. Follow up																		

Appendix 9: SPS Course Evaluation (16 respondents)

1. In general, do you think what you learned in this course will help you in implementing SPS measures at home?

- Yes: 15
- No: 0
- I don't know: 1

2. If you answered "no" or "don't know" to the previous question, please give your reasons.

Comments:

- The agencies responsible for the implementation of SPS have remained inactive to date. Even CRFM and the agency overseeing the lead agency which is CAHFSA are yet to evaluate the situation as it relates to fish and fish products locally.
- The diverse aspects learned in this course will help me and my agency to improve the on-going designing of the SPS system for fishery and aquaculture in the Dominican Republic, since we will try to build it according to the national reality.
- There was very little 'new knowledge' on SPS, but its implementation in Iceland is interesting and served to confirm that we are perhaps on point with regard to our intentions toward implementation.

3. Did participating in the course change your perspective on SPS?

- Yes: 14
- No: 2

4. Please state the reasons for your answer to the previous question.

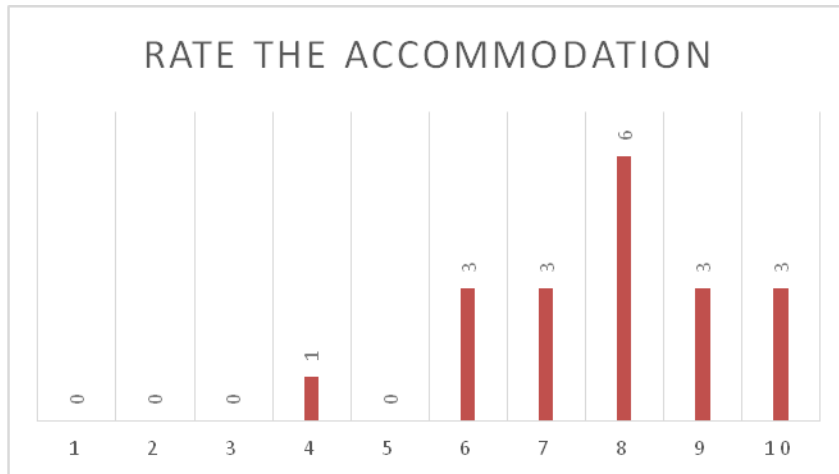
Comments:

- Never really appreciated the intricacies and areas where SPS measures are required.
- I have never before had much information on SPS. The course have allowed me see the importance of having standards not just for export but for the safety and health of local. I am more aware of the importance of how fish is handled as to maintain its wholesomeness.
- From experience in Iceland all indication shows that fishers play a pivotal role in shaping the industry, no middlemen to control the price of fish thus gaining more than the fishers, the consumers dictate and shape the environment for fish and fish products, allot of value added to fish and under-utilized species.
- Gave a little more clarity to complex areas.
- It improved my knowledge and gave further awareness of the issues surrounding SPS.
- Reinforced what I know of SPS and application to Fisheries.
- It was a really big deal for me, knowing back home we seem to be very laid back at most times.

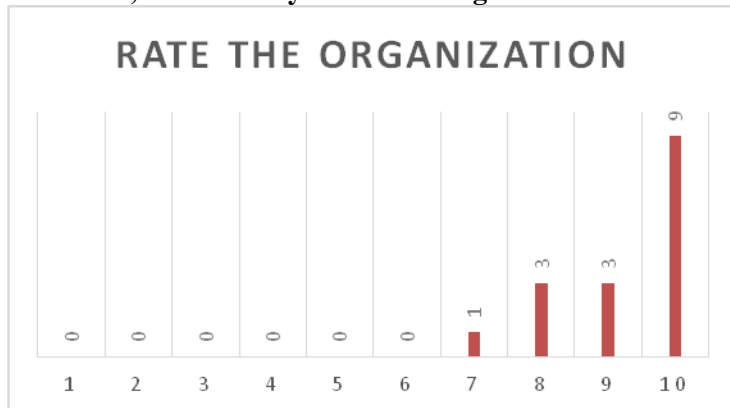
- It shows me how serious and important it is to focus on sanitary measures while handling food. In my country SPS measures will have to be monitored more seriously.
- Our Competent Authority is almost ready for SPS requirements. Some of the prerequisites must be worked out.
- It deepened my understanding of the issues involved, and also how they linked together.
- It showed the complex world of SPS and the amount of work that is required to make "FOOD SAFE". It give as insight as to the cooperation that is required between the various agencies both local and international. We seem to take food for granted and feels that cooking alone can make food safe.
- It's much harder for CARIFORUM countries to successfully apply SPS measures in fisheries management than for present EU member countries as it appears that the rules are stringently applied when it comes to CARIFORUM countries but not so for EU member states; (2) SPS as it currently stands is a very onerous and costly exercise for CARIFORUM countries and many of them do not have the financial resources to fund requirements both in the private and public sectors e.g. monitoring and surveillance requirements for contaminants etc; (3) it will take years without the necessary technical and financial assistance for member some member states to fully implement SPS measures in their home countries; (4) CARIFORUM countries appear to be stalling and wasting time on frivolous issues and must start implementing those measures within their reach.
- Definitely my perspective on SPS has changed. Now I can understand how linked SPS measures are to the whole system of managing, producing, transporting and, more important, making sustainable and profitable business while ensuring that fishery and aquaculture products are safe both for human and animal consumption.
- It was interesting to see how the processing plans operate within the sanitary requirements. The lectures especially with HACCP and the Exercises were quite enlightening.
- Participation in the course did not change my perspective SPS, but it did underscore the many and varied facets involved in fully implementing SPS measures.
- New methods and technology was introduced that I trust would be a great introduction to use in my country.

LOGISTICS, ACCOMMODATION, ORGANIZATION

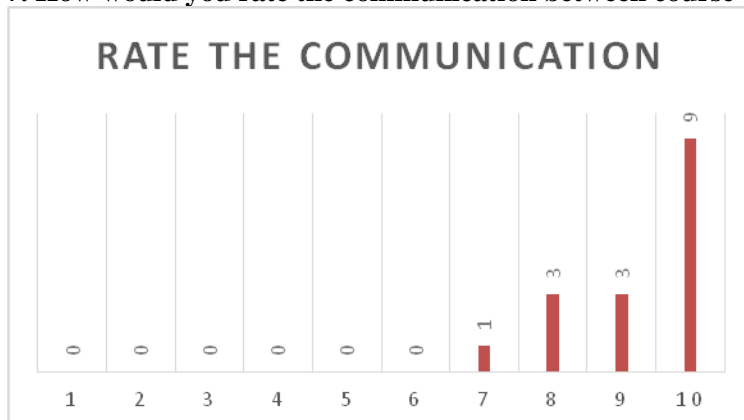
5. Overall, how would you rate the accommodation for the SPS management measures course in Iceland?



6. Overall, how would you rate the organization of the course?



7. How would you rate the communication between course organizers and participants?



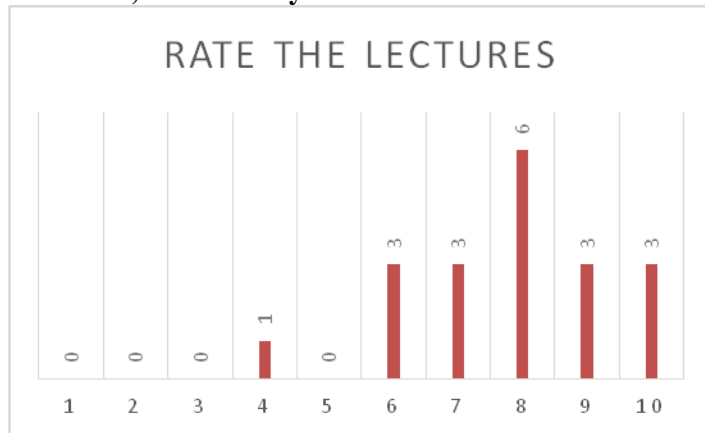
8. Please suggest improvements with regards to accommodation, organization, logistics, and communication.

Comments:

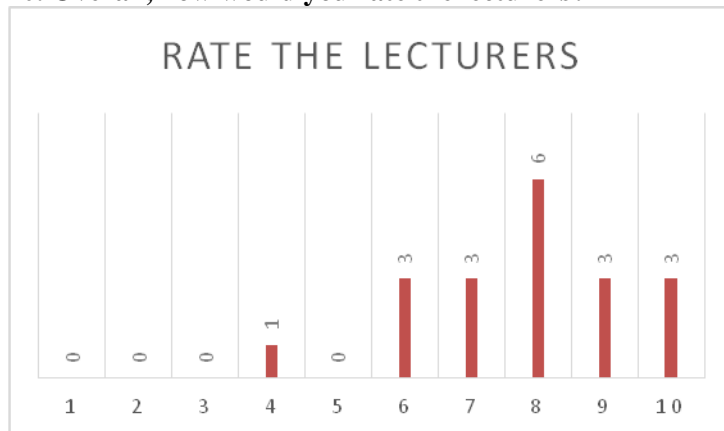
- I think that all went well. Would have appreciated some informal night outings as a group. Like for dinner, or to shopping centers, etc. to have been organized.
- I think this area was well handled organization, logistics and communication were excellent hence no improvements required. In relation to accommodation maybe some changes to the breakfast menu.
- At the beginning of each day a review of activities especially plant visits, for information exchange -15 minutes, everyone did not hear the same things. Also to clear up any (logistical) problems. I think the organization of the course was highly affected by the sequence change of some of the lectures in particular in relation to course work. More time needed to be given to the handling at sea researcher and value chain researcher. Also the change manager researcher.
- Maybe establish communication via whatsapp or similar format. Course was very well received.
- With this being my first trip, I feel very much welcome, very informed, all I can say is thanks to the Management team.
- Everything was just bad.
- Is good till now.
- Some participants require a visa and government authorization to travel to Iceland. This process can be lengthy, and so notification of participation needs to be issued sufficiently early by the CRFM and the UNU-FTP. One participant fell ill while in Iceland, and so medical insurance should be incorporated into the travel costs to Iceland.
- Could not asked for anything more.
- The programme is too short, too theoretical; appeared to be hurried and requires a more practical, hands- on approach to SPS measures.
- Even though the hotel is centrally located there are some problems with internet connection, cable, etc. Food was good, both at breakfast at the hotel and at the meetings locations. Organization, logistics and communication were excellent. The facilitators went beyond their duties to make us feel at home.
- The time between notices of course to start of course should be a bit longer as there were many issues that had to be covered, such as obtaining visas etc. All in all everything was covered well.
- Accommodation, logistics and communications were excellent. Perhaps a little more focus on not just presenting the information but gearing it toward the final outcome objective, which itself was not as clearly communicated.
- The facilities for learning, logistics, organization, communication and organization were excellent. Only suggestion for improvement would be to more precise with timing.

LECTURES AND SITE VISITS

9. Overall, how would you rate the lectures?



10. Overall, how would you rate the lecturers?



11. Which lecture topics were particularly interesting or relevant and why?

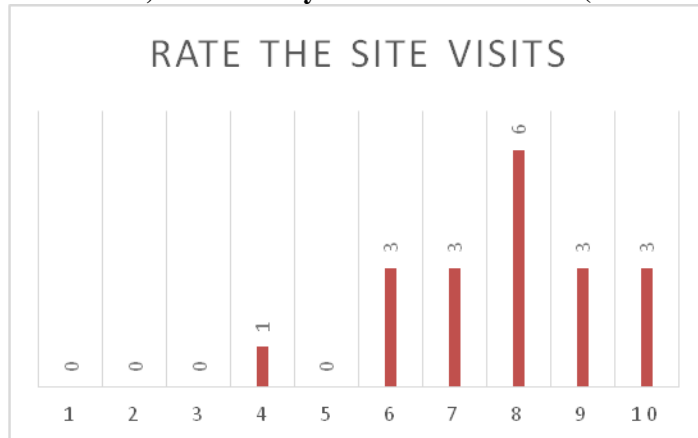
Comments:

- Visit to Ocean Cluster. The mere vision that has gone into value adding to the basic fish was mind blowing.
- Aquaculture, leadership empowerment and implantation, fish handling, fishing for profits, buyer's requirement and cleaning and sanitation. This is because of my present management position in fisheries.
- The role of the Competent Authority - the enforcement chapter within this organization is effective, hence allowing other supporting agencies to collaborate and improve on new experiences, ideas and issues of relevance. Very strong networking.
- Fish handling, fishing for profits, risk assessment, sampling, sampling plans, marketing, and most industry in Caribbean is like Iceland in terms of producing predominantly chilled and frozen products, therefore how you can improve this from at sea is important. Product separation and

adding value within the chilled and frozen value chain, most countries have to set up sampling programmes, so the basics in this area is important.

- HACCP Theories and Procedures. I found this interesting as the implementation of the HACCP system is a major challenge in my country. Getting an overview of the system helped me to understand better the principles and practices involved.
- Traceability, HACCP, WTO/SPS, MAST team. Showed how to organize the regulation and monitoring of the fisheries sector.
- My trip to Matis, food fraud & Caribbean Aquaculture.
- Processing these plants that we visited open up ideas that we can adopt and implement to be more efficient and reliable.
- MAST: to compare the duties and responsibilities with our CA. The implementation of the enforcement procedures for non-compliance. TRACEABILITY: how to manage these procedures. Risk Management: refreshment training.
- Development of Icelandic fisheries, fishing for profits, leadership, food fraud, risk assessment, aquaculture, traceability. These were interesting because they were educational and helped to deepen my understanding of the topics.
- Traceability and Food Fraud. It was really an eye-opening how food fraud can be easily committed.
- The extent of food fraud worldwide and a perspective of the EU and in Iceland.
- Fish handling; using research to drive change; fishing for profits; value of fisheries; empowerment, leadership & implementation; necessity for change in fisheries management; marketing of fish; importance of value chain analysis.
- The lectures related to the detailed steps to establish a SPS control system, including development of leadership and food fraud were very relevant to me. In the first case, I could go back and review if I have been missing an important aspect of SPS system when I am evaluating my own on-going SPS program. Secondly, in the process of establishing SPS measures the lack of leadership and abilities to guide our employees may cause a poor performance of the SPS system and we want to avoid that, and third, food fraud is quite common along the fisheries chain so the course provided a great opportunity to learn about the different types of fraud and what can be done according to our reality to avoid or minimize them.
- The HACCP exercises and topics were relevant as they are procedures that will be needed in the small processing plants to ensure food safety.
- The lecture topics presented by the group from MAST were most relevant as most participants were from regulatory agencies.
- Traceability was the most interesting because it can help to reduce illegal fishing and food fraud.

12. Overall, how would you rate the site visits (i.e. visits to companies)



13. Which site visits were particularly interesting or relevant and why?

Comments:

- Snaefellsness field trip....the efficiency at the processing facility and how SPS measures were of paramount importance.
- Site visits to large and family oriented processing establishment. Indicates that food safety is of utmost importance to the processors and consumers. Always thinking of innovative ways to expand and exist on the market.
- Ocean cluster, view of range of products, model of business development.
- Fiskidjan Fish Processing Facility. Mainly because it favors the type of small scale establishments in my country and seeing this type of operation with a fully comprehensive and functional HACCP system is very impressive. It further shows that it can be achieved in my country.
- Ocean Cluster and Auction house. Highlighted how the use of technology can maximize the utilization of resources.
- The fish farming site we went to on Wednesday 27th April 2016. The fishermen always throw them over board.
- Fish Auction Market (FMIS) this company operates in nine locations in Iceland. It amazed how efficient technology can be. The bulk of the catch sold through FMIS.
- Processing plant: make a comparison regarding quality assurance and new technology.
- Ocean Cluster, Auction house and market where fish landings were observed, small fish processing plant in Olafsvik, geothermal plant and aquaculture farm. These brought together different aspects that contribute to successful industry operations in terms of profitability, efficiency of operations for profit, food safety, innovation, use of renewable energy.
- The Fish Auction Company and Fish Market. I would not say relevant for us as we don't have that volume to work with. It was however interesting to see in real time the speed of which the

products are sold, just a pity we did not see how the products were packed and shipped with such speed also.

- The offloading and icing of fish was really fast. The use of mechanized technology was impressive. This method can really assist with the way we process and move products in the Caribbean. It might be a bit expensive but it can cut down on the exposure time of fishery products which can increase microbial growth.
- Fish market and fish auction to see the use of technology to drive change and to see first-hand how fish is offloaded, handled and to look at the design, layout, construction and operation on a fish port and market; field trip to Snæfellsnes to see the operation of a small fish plant. If they can do it so can we! MAREL and seeing the importance of innovation in the fishing industry.
- All the visits were relevant. I was particularly impressed by the net of business agencies working towards developing and marketing of products with added value at Iceland Ocean Cluster and also the visit to HB Grandi provided us with an insight of how a large and state-of the art company integrates the best use of SPS to the management of its products throughout all the production chain.
- The Fish plants as it shows the processing procedures that is needed in the Caribbean and also the visit to the Ocean Cluster was interesting as it related to research and innovation which is lacking in the Caribbean.
- The visits to the Auction facility and the landing site was extremely interesting. As small island states we aim to be as efficient as possible. We do not always have the financial resources but we can make better use of the available technology.
- The most interesting visit was to HB Grandi. The efficient use of both personnel and up to date technology was intriguing. It helps to reduce time and flaws in production. The visit to the Geothermal plant was interesting as well. The use of natural resources and sustainability are always useful and should be used everywhere.

14. Which site visits were not relevant, and why?

Comments:

- National Park. Did not quite catch my interest or attention.
- I think there was a good mix of work and sights of Iceland, I would not say site visits were not relevant, but another plant other than chilled and frozen would have made a difference.
- None. They all showed relevance to Icelandic fisheries development. One has to remember where they came from to know where they are going.
- Not too sure, I am still learning.
- Stolt Sea Farm in my country this farming is not popular.
- None. 1. Regarding Implantation SPS req. Is good 2. Sightseeing: good but the weather was not good.

- All site visits were relevant.
- All sites were relevant. The least would be Hellisheidar Geothermal plant as it was not directly applicable to the course but of significance to us to understand the technology and how it impacts on the Icelandic community.
- All the visits were relevant including those not related to the course topics but to the impressive nature and culture of Iceland.
- I considered all site visits relevant.
- All were relevant, interesting and useful.

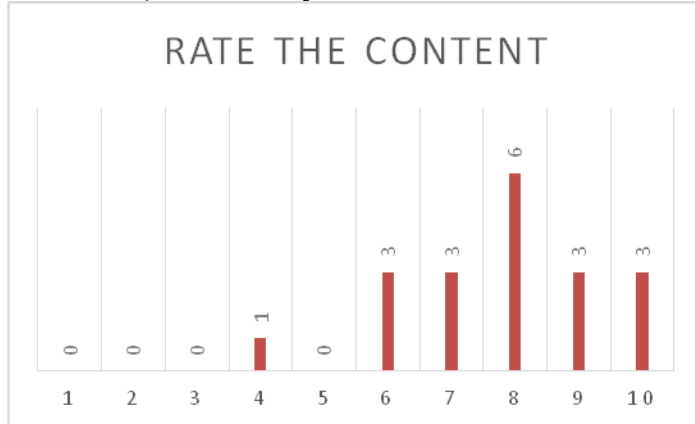
15. Please suggest improvements, if any are required, to lectures and site visits

Comments:

- Some of the powerpoint presentations were too clustered with information when proved difficult to follow.
- Most establishments are HACCP etc compliant, having hands on interaction in the implementation and development of these protocols would have been an asset {the dos and don'ts in an establishment} e.g. practically seeing the ways fish are handled from long lines and nets to be placed on ice/chillers.
- A visit to salt fish plant, or lecture on its production, plant that uses fish mince, bones, etc. More practical research examples in lectures to get over the points.
- Personally, I think some of the lecturers could have been a bit more spontaneous with their presentation and not present as if it's just another topic or lecture.
- Some of the lectures need to be more lively; too dead.
- Sightseeing events need to take the weather into account.
- Site visits are very good and no suggestions for improvement. Regarding lectures, some lecturers spoke softly at times. If it is possible to simplify the technical information further, this could be attempted, although I could see that there was already effort in this regard.
- I would include a little more into the accessibility to the various EU Directives. It's easier to list the number, but would be useful if we all knew how to find them. Some of the lectures needed to be more in-depth.
- I would suggest, if possible, including a visit to a fishing vessel and including an exercise for the students to evaluate if it implements good hygiene practices.
- Some of the lectures should make the presentation a bit more animated and interactive and more exercises should be given.

- From the many comments of the participants, many of the lectures were 'flat'. While the lectures contained useful information, in many instances the presentations were less than energetic or engaging.
- Some lectures were not particularly interesting due to reading of slides and monotone voices. Site visits were useful.

16. Overall, how would you rate the content of the course?



17. What was the most interesting thing you learned during the course?

Comments:

- The true value of fish.
- Adding value....I never viewed it the way Thor explained....value can be added by the way the product can be handled....additionally the importance of SPS measure in the food industry on a whole.
- Fishing is a very rich and productive industry with great profitability even to the fishers. We have been made to believe that every fisher involved in the fishing industry is poor and uneducated.
- The structure for fishery product development & business development, the basis on which the fishing industry developed trained scientist especially food scientist, the recognition of the need for investment, setting up training programmes especially for fisheries.
- Most food laws in fisheries are fashioned after those of the EU.
- Acute awareness of the relationship between SPS and quality to the price and secure marketing of the product.
- How connected and informed everyone is.
- Cleaning and sanitizing because I could apply this knowledge to our processing plant.
- Traceability and Risk assessment.

- Innovation through partnership (Marel, Ocean Cluster, Aquaculture field visit and lecture), Discipline in management of the industry at all levels, providing for sustainability, profitability, full and optimal usage of the available raw material, and innovation for value addition.
- Apart from the History of Iceland (that summer begins with at whooping temperature of 3 degrees) I would say the existence of Food Fraud within the Union also.
- Understanding the importance of correctly analyzing the fish value chain and how revenues can be significantly improved from less.
- The diverse aspects to take into consideration while establishing a SPS control system, the business opportunities that might arise when products are produced under good sanitary practices (fish for profits but also for consumer's health assurance).
- The need for ice and keeping the fish cold during the whole processing chain.
- The information from Ocean Cluster was definitely different. The total automation of the auction was very compelling.
- Traceability.

18. Which lecture topic(s) did you find particularly useful? (Please list topics and/or names of lecturers)

Comments:

Lectures	Number of participants indicating this was useful
WTO/SPS/Technical barriers to trade	
SPS and world fisheries	
Fish handling	
Microbiological risks	
Cleaning and sanitation	
Fishing for profits	
Development of Icelandic fisheries	
HACCP theories and procedures	
Sampling techniques	
Processing water quality	
Empowerment and leadership	
Buyer's requirements	
Marketing of fish	
Food outbreak investigation	
Risk assessment	
Chemical risks and official control/EU requirements	
MAST, competent authority	
Food safety and monitoring	
Food fraud	
Aquaculture and fish health	
Traceability	

Packaging material	
Value addition	
Value chain analysis	
Site visits	
HB Grandi	
Ocean Cluster	
Ny fiskur (HACCP)	
Bylgjan fish processing plant	
Stolt Sea Farm	
Fish Auction	
Fish market and landing site	
MAREL	
MAST, competent authority	

19. Were there any lectures that were unnecessary? What would you have removed from the schedule? (Please list topics and/or names of lecturers)

Comments:

- All relevant considering the topic to cover "SPS Measures" some lecturers were not best placed in the delivery.
- Only need 1 lecture on WTO, would have been useful to talk about Codex for FFP.
- I would not have removed but I would have had more Lectures in Aquaculture and food safety related to aquaculture as there are more stringent requirements for export as it is a farmed fish.
- Those on basic HACCP and Sanitation.
- All lectures connected with each other.

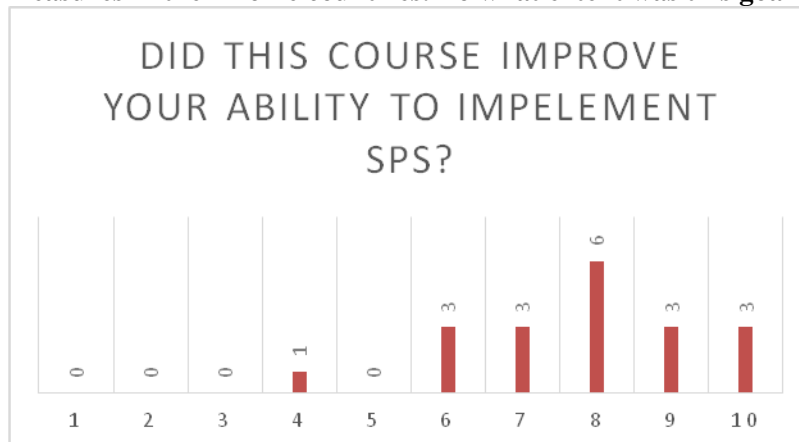
20. Did you see or learn about anything in the course that you would like to apply at home? If yes, what?

Comments:

- All has its relevance and importance in my field of responsibility.
- Yes. Having staff understand what is SPS and its importance to food safety. Additionally, fishers would be also informed of how critical the use of ice is and how the handle of product can also add value....I shall have to go over these information on my own time to have a better understanding also....this has encourage me to research on SPS.
- Fish handling {post Harvest} Sanitation fishing as a business {fishing for profit.}
- Too numerous to mention. Most of things require persons to be appropriately trained. It is a pity the training programmes in Iceland cannot be conducted in the Caribbean region in a holistic manner.
- The types of laboratory tests necessary for fish and fish products destined for exports.

- Yes. Reorganization of the sector applying sensible technology. Apply quota system for fishermen.
- Apply traceability aspects to sector, etc.
- Yes, information sharing, proper food handling, especially fish.
- Fish handling - this knowledge I can apply in my country.
- Traceability 2. Risk assessment.
- Innovation for value addition and creating partnerships for this. - Improved fish handling and usage of all available raw material. - Shift towards limited access fisheries management. - Improved fisheries data and information systems. - Improved education and attitude of all stakeholders and general public to support improved discipline in fisheries industry management at all levels.
- Traceability and Food Fraud.
- Food safety monitoring.
- Yes, Monitoring & evaluating fish and food fraud. Also, I would to start incorporating to our SPS system some of the aspects that were not considered such as preparation and emergency response before a SPS crisis occurred.
- I would like to apply HACCP in some smaller plants, I would like to have more awareness on handling and use of ice on artisanal boats.
- The power of cooperation. (1) The basis of the Cluster (2) How the staff of UNU work so well together.
- Yes. Traceability will definitely be improved in my country.

21. One goal of this course is to strengthen the ability of participants to implement appropriate SPS measures in their home countries. To what extent was this goal achieved?



22. Please give reasons for your answer to the previous question.

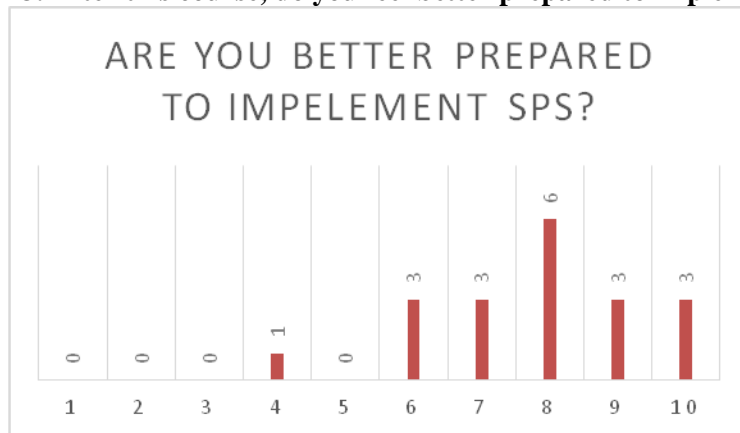
Comments:

- To me it came over as a seminar on exporting to the European Union and not as a course to teach 'how to' and 'what is required' as it pertains to implementing SPS standards in the individual Caribbean Country.
- Since the implantation of SPS is not solely on me, this course gave me the relevant information to guide others in the direction of SPS measures and its importance.
- Lack of hands on training "learning by doing".
- I think a more realistic goal should have been "to sensitize countries on the measures that are needed to implement SPS" Your 6 month training programmes are more appropriate for that goal listed at 21.
- I now have improved knowledge and a better understanding of HACCP and SPS. I am aware of the agencies necessary for SPS implementation.
- I can now appreciate the need for the SPS control measures. I now see how it can be applied effectively.
- It helps to better understand the importance the fishing industry is. And what we are taking for granted.
- This course was based on SPS measures.
- All the items for setting up an appropriate SPS measures are overviewed, but I think each country should get an individual guidance, because each country has their specific difficulties.
- Purpose of course was to improve understanding of the management context of SPS, and course has demonstrated this nicely through illustrating the management link to sustainability, food safety and public health, profitability.
- I still see some doubt with some of the participants. They appear reluctant to fight, probably they feel they are not powerful enough to push such. I would ask each member to tell us about their role and how much influence they have in their country.
- Many hurdles still exist and are difficult to overcome.
- I have been dotted with appropriate information to implement SPS, now it is my duty to customize those given tools to our national reality.
- It is not only lectures that will strengthen implementation, other factors such as resources, Financial and equipment and other resources will determine the successful implementation

This program may not have strengthen the ability to implement SPS but has certainly strengthen the resolve to get it done.

- Approval by authorities are required for implementation.

23. After this course, do you feel better prepared to implement SPS at home?



24. Please give the reasons for your answer to the previous question

Comments:

- More how to export to the EU.
- From not having a clue to an understanding of SPS and its relevance, I feel confident to begin the discussion towards SPS measures at my fish market.
- The things that need to be done are reinforced, and one is motivated to act now, specifically on those activities that the capacity is already there, particularly to safe guard the small export market i.e. in the area of baseline data on product hazard levels, and traceability. Please be aware the aspect of risk assessment is dependent on having appropriate baseline data. Therefore in most cases it is a step-wise process, or foundation building. But Also other aspects not specifically related to SPS need to be implemented such as product development which is also a priority for some.
- I now have a better understanding of what is required to implement the system.
- This visit has been an eye opener for me and I already planned my approach to organizing my fisheries sector.
- I am hoping to go back home and me with my fisheries personal to come up with new and better way to move the fishing industry forward.
- Because SPS measures is very important in order to compete in the international market.
- Refreshment and some items give you a trigger to do it better.
- The course allowed me to see first-hand the tangible value of SPS to food safety and the attendant benefits and also profitability, and how these are totally dependent also on well managed fisheries.
- The direct observations afforded by the Iceland experience have instilled greater confidence in me for my work aims.

- The comparison of what is done here and how it's done home will give me more confidence to prove that it can work.
- Its gives you more credibility.
- I have been noted with appropriate information to implement SPS. The site visits complemented the necessary practical experiences to better understand the systems. Again, now it is my duty to customize those given tools to Dominican Republic's reality.
- I would have learnt a lot during the past two weeks which was the objective of me coming here.
- Same as above.
- Yes, because different techniques were discussed which would be useful to implement in my country.

25. What support do you need from your government upon returning home to successfully implement SPS measures?

Comments:

- Financial and human resources.
- There is need for my counterpart in Trinidad to extend the work already started to Tobago...discussion at the highest level on SPS would be encouraged.
- Functioning Networking - agencies having clear guidelines Competent Authority to realise fish and fish products are food and need same attention as other food products Effective collaboration with partnering countries on successes - good models Effective MCS at port of entries.
- Everything begins and ends with funding.
- Financial and human resource, involvement of the relevant agencies, SPS seen as a priority.
- More trained personnel, financial resources and political support to engage the masses in implementing control measures.
- With whom that came before me and with me to sit with our superiors, and to seek a forum with our ministers.
- Come on board fully.
- Financial support for buying equipment for accreditation laboratory and for certification the inspection unit.
- I work at the regional level. Governments need to prepare industry development plans that take into account sustainability, food safety, profitability, and innovation. Such plans need to reflect required partnerships among various stakeholders and government ministries. The plan should identify practical priority goals and tasks, perhaps with some low hanging fruit to start with.
- Apart from a listening ear, more human resources and a freer hand to implement certain changes

- Implement modern food safety legislation or MoUs between agencies in accordance with international norms, seek accreditation for laboratory methods of testing for various contaminants and undesirable substances; develop monitoring and surveillance programmes for these substances; document procedures for prerequisite programmes and HACCP; government agencies need to end turf wars and work towards the better good for industry and country.
- The willingness of people managing SPS in the various agencies to coordinate actions. Also to make the necessary changes to legal framework to accommodate SPS control measures in fisheries and aquaculture products. Incorporate sufficient and trained personnel for monitoring, control of hygiene and sanitary measures, purchase of basic equipment for SPS monitoring. Logistic support.
- Financial and human resources are always needed, Funding to carry out training and implement the measures. Funds to improve infrastructure and vehicles to enable transportation to the various landing sites.
- Freedom to manage, and financial/human resources.
- Approval of ideas and funding.

26. What regional-level support do you need upon returning home to successfully implement SPS measures?

Comments:

- Create a database or stock of experienced individuals who can assist other countries based on their proven experience.
- Assistance to convince heads.
- CAHFSA to help in the implementation of SPS measures networking with other countries in successful models, implementation, success stories continuous updates of new or issues of relevance.
- Hands on training specific to SPS or including a curriculum specific to SPS at Universities.
- Maximize the funding from the EDF on SPS. Regional projects are more attractive than bilateral arrangements. The area of capacity building in practical ways is crucial.
- Harmonized legislation, proper networking.
- The CRFM needs to establish a better platform for the sharing information and ideas and resources across the region.
- In proper food safety, proper data collection & data sharing.
- Work close with each other and grow stronger.
- Sharing information and knowledge.

- Member States must be committed to national fisheries SPS goals and ensure that these are reflected in agreed regional (CRFM) plans and activities. - Regional-level network should be set up to provide support for harmonization of legislation, regulations, protocols, and guidelines (already in progress) and for SPS governance coordination (already in progress).
- Value Addition Research and Innovation network should be developed at regional level if possible. - Regional efforts should establish a system for sharing of data, information and knowledge on the fishing industry - for various users, with SPS given priority.
- Exposure to the various SPS strategy being used in the Caribbean and to use one country as a success story for us to market.
- Improved communication between countries by sharing successes and expertise; commitment by member states to share resources for monitoring contaminants and undesirable substances in wild caught fishery products.
- CRFM to continue supporting SPS personnel through training, networking, organization and development of the in house trainings at national levels.
- Hosting of exchanges between countries, provision of technical, financial and other support to assist in the implementation of the SPS measures.
- Collection and sharing of data through an open internet portal.

The CRFM is an inter-governmental organization whose mission is to “Promote and facilitate the responsible utilization of the region’s fisheries and other aquatic resources for the economic and social benefits of the current and future population of the region”. The CRFM consists of three bodies – the Ministerial Council, the Caribbean Fisheries Forum and the CRFM Secretariat.

CRFM members are Anguilla, Antigua and Barbuda, The Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Haiti, Jamaica, Montserrat, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Trinidad and Tobago and the Turks and Caicos Islands.

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