



CRFM Technical & Advisory Document Series

Numbers 2010/01

Managing Praedial Larceny in Fisheries – New Technologies and Challenges

Prepared by:

**Terrence Phillips, Programme Manager, Fisheries Management and Development
and Jannel Gabriel, Regional Project Coordinator, CRFM**

and presented at

**Regional Consultation on Praedial Larceny
21 - 22 September 2010
Saint Lucia**

CRFM Secretariat, Belize

2010

1.0 Introduction

The fisheries sector, including aquaculture, plays a significant role in the economy of the Caribbean Community. Economic data from fourteen CARICOM Member showed that the GDP contribution of fisheries ranged from 0.01% to 2.5%, or from 0.115 M US to 77 M US\$ in 2008. The sector employs approximately 332,000 fishers, boat owners/operators, boat builders, dock workers and processors. In 2007, total marine production was over 102, 000 tons, with total exports being approximately 47, 800 tons or 208 M US\$. The fisheries sector contributes to food security by providing an important source of protein to many persons, especially in rural communities, in the region.

2.0 Praedial larceny and piracy in the fisheries sector

Praedial larceny is a criminal offence characterized by the theft of agricultural produce from the land, farm or estate. In many cases the praedial larceny legislation of CARICOM Member States also makes provision to cover offences that include the theft of agricultural equipment, materials such as agri-inputs as well as secondary products such as feed and fodder (Draft Analysis of the State of Praedial Larceny in Member States of CARICOM, 2010).

Maritime piracy, as defined by the United Nations Convention on the Law of the Sea (UNCLOS) of 1982, is any criminal acts of violence, detention, rape, or depredation committed for private ends by the crew or the passengers of a private ship or aircraft that is directed on the high seas against another ship, aircraft, or against persons or property on board a ship or aircraft (United Nations, 1982).

Praedial larceny and piracy differs from the other hazards that threaten fisheries activity in terms of its nature and by extension the countermeasures to be adopted in managing the risks associated with it. The hazard is one of criminal intent involving the protection of an asset in its physical location, and the proof of ownership of the asset or parts of it when in the possession of the alleged perpetrator or a third party recipient (Draft Analysis of the State of Praedial Larceny in Member States of CARICOM, 2010).

This paper / presentation provides an overview of praedial larceny and piracy within the fisheries sector, including aquaculture, and examines some of the strategies and tools that can be used to address such crimes and the likely challenges.

2.1 Overview: praedial larceny and piracy in the fisheries sector

Global

In Asian countries such as Bangladesh, China, Indonesia and Thailand, and African nations such as Somalia, Tanzania and Zambia, small scale fishing is seen as a means of combating poverty and hunger. Fishers in these countries are vulnerable to natural disasters and generally have limited access to land and medical facilities. The vulnerability and risk to their livelihoods is increased as a result of theft of their fish, boats and nets. In Bangladesh for example fishers are targeted as victims of piracy particularly during the *Hilsha* fishing season where they may be kidnapped for a ransom. (Jentoft et al, 2010). Traditional perceptions of shared common natural resources have also led to theft or redistribution of fish from aquaculture farms in these Asian and African countries (Little et al, 2010).

Piracy along Africa's East Coast, particularly in Somalia, emerged as a result of a combination of political and environmental issues. Specifically, the country's collapsed governmental structure and weakened political and judicial system and the deterioration of its fishing industry due to alleged widespread pollution and increased competition from foreign vessels. Somalia's coastline extends for over three

thousand kilometers along the Indian Ocean which contains large fish species such as mackerel and tunas; smaller species such as sardines and anchovies; shark species and lobsters (FAO, 2005). Due to its rich supply of aquatic resources this area is heavily fished by larger, more competitive foreign fishing vessels. In 2005 the Food and Agricultural Organization of the United Nations estimated that 220 foreign fishing vessels were engaged in unlicensed, illegal fishing in Somali waters. The region is also a key shipping route for transcontinental vessels.

Confronted by these issues fishermen began seeking alternative means of generating income and protecting access to their resources. In the absence of a functional law enforcement system, other criminal organizations soon began targeting commercial fishing vessels and shipping lines in a series of increasingly brazen and dangerous armed attacks. In 2008, tuna vessels were attacked three times, in one case resulting in the payment of a one million dollar ransom (Voice of America, 2009).

CARICOM

In CARICOM, after the crop and livestock subsectors, marine capture fisheries and aquaculture face a high risk for praedial larceny. In the Draft Analysis Report, it was indicated that from all the information received it would appear that praedial larceny impacts all types of farmers, crops, livestock, fisherfolk and aquaculturists. In policy and strategy documents, Jamaica, Trinidad and Tobago and St. Vincent and the Grenadines have reported that praedial larceny is a threat to livelihoods in farming and fishing (Draft Analysis of the State of Praedial Larceny in Member States of CARICOM, 2010). Fishers are most frequently robbed of high valued lobster and other valuable species, outboard engines, batteries, navigation equipment and communication devices which are easily disposable. They are also robbed of vessels, fishing gear and supplies such as clothing and food.

In Antigua and Barbuda, it is felt that the incidence of praedial larceny is more frequent in the fisheries sector, despite the use of various modern technologies such as GPS and the pop-up system to conceal the location of fish pots. Fisherfolk also avoid setting their fish pots in shallow water. Lobsters appear to be the preferred product. In Jamaica, official figures report annual loss to farmers and fishers, including aquaculturists, in excess of US\$50.0 million or 6% of gross output, while Belize estimated annual loss to be over US\$300,000. In The Bahamas, the estimated loss to the marine capture fishery from praedial larceny is said to be in the vicinity of US\$16 .0 million (Draft Analysis of the State of Praedial Larceny in Member States of CARICOM, 2010).

In 2010, it was reported that there were at least three cases in which fishermen were robbed and/or beaten off Georgetown and the Corentyne, Guyana (Guyana Times, 2010). In these instances the pirates were armed with guns and attacked the fishers while they were on the open sea or in rivers. The dangers and frustrations associated with such losses have led many fishers to abandon their livelihoods. In some cases fishers no longer want to fish out of fear that they will be the victims of theft while in other cases the cost of replacing stolen engines or boats is more than they can afford. So, even though they may want to continue fishing they are incapable of doing so.

Aquaculture fish farmers though relatively small in numbers experience frequent loss from praedial larceny. Persons allegedly steal freshwater fish in their boots and pockets as well as by draining the pond of the entire harvest of fish. In some instances, aquaculture enterprises have been abandoned due to the high cost of security measures and heavy loss to theft. Farmers employ various measures to protect the crop from theft. These include harvesting before the crop is fully mature in order to secure the produce. This applies primarily to crops such as potatoes, yams and in the case of fish the aquaculture ponds. (Draft Analysis of the State of Praedial Larceny in Member States of CARICOM, 2010).

Praedial larceny in the agriculture sector would appear to be linked to food insecurity, with weak access to basic household needs, including household food being a factor. However, further investigation as to the causes of praedial larceny would appear to be required (Draft Analysis of the State of Praedial Larceny in Member States of CARICOM, 2010), more so for the fisheries sector.

Praedial larceny poses a direct financial loss to the fishers and their families, as well as the rest of the community members who earn income through employment as fish processors, vendors and dock workers. It also presents a social problem by introducing or propagating crime in low income fishing communities.

2.2 Current strategies and plans to address praedial larceny and piracy in the fisheries sector

Global

In Zambia governance reform has led to the formation of Fishers' Associations and zoning of fishing areas. This has reduced isolation in these regions and increased security for fishers and their equipment. (Malasha, 2007).

The United Nations Office on Drugs and Crime has outlined several strategies to address the issue of maritime piracy. These strategies focus predominantly on increased prosecution, providing training and support to the police, judiciary, maritime authorities and prison management officers; witness and trial support; prison repairs and refurbishments, and the development and sharing of regional expertise. Under the law of the sea rules warships are allowed to board any vessel reasonably suspected of being involved in piracy. A legislative review has led the UNODC to grant non-Somali naval vessels the right to enforce the law of the sea rules on pirate vessels in Somali territorial waters.

The United Nations' Counter-Piracy Program, in collaboration with the governments of Australia, Canada, the European Union, Germany and the United States, has funded the initiation of a special court in Kenya for hearing maritime piracy cases. This will help increase the speed and efficiency of prosecuting pirates and may serve as a deterrent to pirates in the future.

The case has been made that the reduction of piracy in Somalia will come about when a stable central government is reestablished. Lawlessness which is rampant now may be curbed by the presence of a functioning police force or military body. Also a stable country will be in a much better position to manage its natural resources and ensure that illegal fishing by foreign and local entities is eradicated. Several technological solutions are being used by commercial fishers, shipping lines and coast guards around the world to combat piracy on the high seas. The following are some such measures which can be utilized by boat owners / operators to deter theft and protect their livelihoods.

- High Frequency Surface Wave Radar (HF SWR) to detect small boats well beyond the horizon at up to 25 km.
- Automatic Identification Systems, a new technology which allows ships to transmit information about their identification (ship name, registration etc), cargo, position, course and speed over a common VHF channel. (US Coast Guard) Coast guards can use this technology to monitor and identify vessels moving through their waters or they can make it a requirement that any vessel fishing in their waters must have AIS on board.

- Panoramic Area Surveillance System (PASS), this is a 360° video camera and display system for visual identification, movement detection and threat level alarms. It is currently being enhanced to incorporate infra-red systems for detection.
- Passive Radar Identification System (PRISM) provides early warning of an unidentified radar carrying vessel.
- Laser Dome, improved lighting to increase the likelihood of detecting intruders within the immediate vicinity of the ship at night and act as a deterrent. (MarineBuzz, <http://www.marinebuzz.com/2009/09/09/bae-systems-reveal-anti-sea-piracy-systems/>).

In addressing the problem of praedial larceny and theft on fish farms in African and Asian countries owners and operators use simple strategies such as hiring family members or local labourers with whom they are familiar. Also, recognising that some communities view rice fields in which some fish farming occurs as ‘common property’, owners may also strive to develop and maintain good, benevolent relationships with neighbours, village elders and community members so as to deter theft and vandalism. When affordable or necessary they also take a precautionary approach by hiring security personnel, using guard dogs and electronic surveillance cameras
<http://www.fao.org/docrep/field/009/ag148e/AG148E01.htm>

In Hawaii legislative action has proven useful in responding to praedial larceny on aquaculture farms. It has enacted aquaculture legislation which makes the theft of aquaculture produce or equipment a Class C felony, punishable by a minimum of one year in prison. Specialized insurance policies have been created by insurance companies in the US and UK to protect farmed fish against pollution, theft, predators and damages caused by a breakdown of aquaculture machinery. The FAO has suggested the use of wire hooks, wooden stakes and barbed wire as simple means of thwarting theft of farmed fish from aquaculture ponds. The stakes are driven into the bottom of the pond and wrapped with barbed wire, and the wire hooks are secured with concrete at the bottom of the pond. In this way when thieves attempt a wholesale theft by casting their nets into the ponds, the nets become tangled or ripped. (Coche et al, 1996)

CARICOM

As with instances of IUU fishing, there is insufficient information on praedial larceny and piracy in the fisheries sector. Additional data/information on the number and location of incidences, quantity and value of fish stolen, equipment, etc. and prosecutions and outcomes are required from the Member States in order to adequately determine the extent and impact of such crimes. Such information would provide a better understanding of the scope of the problem, its economic, social and psychological impacts on communities, and will aid in development and enforcement of praedial larceny and piracy laws and programs designed to prevent, deter and reduce these crimes.

Policy, legislation and enforcement

From 2005, some of the Member States adopted bold actions for praedial larceny prevention and reduction, with Jamaica, Trinidad and Tobago, Grenada, St Vincent and the Grenadines, Saint Lucia and Barbados being among the countries that to varying extent have given attention to policy and legislative frameworks and created institutions and special programs for managing the risk associated with praedial larceny. Then, several countries initiated actions as reflected in the Agriculture Policy and Strategy documents of the respective countries and the Report of the outcome of a 2005 Regional Consultation on Praedial Larceny Prevention held in Barbados. However, a more aggressive and intensive approach to praedial larceny prevention and risk reduction began to emerge in 2008 (Draft Analysis of the State of Praedial Larceny in Member States of CARICOM, 2010).

The extent that such actions included the addressing of praedial larceny and piracy in the fisheries sector is still unclear. In Jamaica, the definition of praedial larceny includes the unlawful taking of crops, livestock and fish (Jamaica Praedial Larceny (Prevention) Act faolex.fao.org/docs/pdf/jam70870.pdf), while Guyana has amended the Anti-piracy Act to make piracy a non-bailable offence (Ministry of Agriculture, 2008, <http://www.agriculture.gov.gy/Bulletins/March%202008/Continued%20efforts%20to%20tackle%20piracy.html>). (Last retrieved 31 July 2010).

Technology and administrative programs

Guyana's Coast Guard has reportedly developed an Anti-piracy Coast Guard plan and added four more boats to their fleet with the objective of increasing surveillance and patrols and thus deterring piracy (<http://www.agriculture.gov.gy/Bulletins/March%202008/Continued%20efforts%20to%20tackle%20piracy.html>). Coast guard officials have noted that they would be able to respond to attacks against fishermen more effectively if these were reported as soon as they occurred instead of several hours or even days later. As such, they have invested in a modern communication system which allows fishermen to remain in contact with coast guard officials and radio for help in the event of an attack. Radio stations have been set up in two coastal fishing villages and fishers have only to purchase the handsets in order to communicate with the Coast Guard and other boaters. Fishers have been asked to purchase and wear GPS wrist watches which will be used to indicate their locations when they radio for help (<http://www.stabroeknews.com/2010/stories/06/30/gov%E2%80%99t-promises-fishermen-tech-aid-in-piracy-battle/>).

The Government is also planning to use a Vessel Monitoring Systems (VMS) which utilizes electronic transmitters to track the location of fishing vessels. Suggestions have been made to utilize smaller transmitters which can be embedded in the vessel and which will go unnoticed by thieves and pirates. Using VMS the locations of participating vessels are transmitted to a central command center via satellite. VMS have proven their worth in monitoring, surveillance and control of areas of ocean in North America and have even been used as admissible sources of evidence in law cases against illegal fishers.

Communication and collaboration with other governments and among organizations such as the Coast Guard, police force and fisherfolk organizations have been identified as instrumental in the fight against theft in the sector.

An online forum for recreational fishers in Bermuda illuminated some of the strategies that fishers have come up with for marking their fish pots and traps in order to deter thieves and prevent the theft of their equipment. Besides soldering or engraving initials and other identifying markers into the equipment, fishers may also record the location of their fish pots using a handheld GPS unit. In this way the thieves cannot readily spot the trap but the fisher has an accurate means of recovering it. Another method is to fill a small balloon with ink and place it on the ropes holding the fish pot or fish trap. Thus, when the pot is pulled out of the water and the rope is dragged across the side of a boat or winch, the balloon breaks covering the thieves and their vessel with ink.

Resource allocation

Even though quantification of the full impact of piracy on Guyana's fishing sector is still to be determined, the loss to the sector has been significant enough to warrant the creation of a G\$5 million anti-piracy revolving fund. These funds will serve to compensate fishers and other boat owners who are victims of piracy. However, in order to benefit from the fund, boat owners are required to pay an annual fee of 0.25% of the evaluated cost of their operations (boat, fishing gear and engine) (<http://www.stabroeknews.com/2008/stories/04/01/anti-piracy-revolving-fund-launched>).

3.0 Recommendations

Strategies and plans to address the problem of praedial larceny and piracy within the fisheries sector, including aquaculture, need to be multi-faceted. They must include appropriate legislation and stringent monitoring, control and enforcement mechanisms in order to prevent, deter and reduce praedial larceny and piracy in our waters, onshore or on farms. Strategies should be aimed at preventing such crimes as well as tracing the stolen goods to the point of disposal and back for effective prosecution. Community outreach programs and social interventions can be designed with the aid of key stakeholders and keeping the most vulnerable in mind.

Being aware of the scarcity of resources to undertake such actions and the need to make the best use of such resources, the strategies and plans can be incorporated or closely linked with National Plans of Actions to Prevent, Deter and Eliminate IUU Fishing and those addressing SPS and safety in the fisheries sector, including aquaculture. Due to the shared nature of the fisheries resources and the proximity of the countries in the region, these matters would have to be addressed at the local/community, national and regional levels.

The strategy for improving the effectiveness of MCS includes the following:

- Increasing the level of compliance with fisheries and related regulations by fishers.
- Establishing an integrated cost-effective MCS system, including the use of VMS.
- Reducing the relative benefits and raising the costs of IUU fishing
- Making management more efficient because inefficient domestic fisheries management works as a driver for IUU fishing.
- Establishing effective penalties as a deterrent to IUU fishing.

The main elements of the strategy for enhancing the effectiveness of MCS include:

- Implementation of international instruments including the IPOA -IUU
- Development and implementation of national plans of action (NPOAs)
- Establishment or strengthening of regional databases and other information systems
- Flag states cooperating with other states through information exchange and other means to ensure compliance
- States taking action to prevent natural or legal persons subject to their jurisdiction from engaging in IUU fishing and related activities (CRFM, 2005).

With aquaculture being seen as a developing area for improved food security and poverty alleviation and being in many ways similar to agriculture/crop farming, more consideration should be given to addressing some of the issues related to preventing, deterring and reducing praedial larceny within this context.

Legislation and enforcement

A review of existing legislation may be necessary to improve on the legal framework to address the situation regarding praedial larceny and piracy in the fishery sector, including aquaculture. Such reviews should give consideration to the extent to which such laws/regulations can be linked to those addressing IUU fishing and SPS and safety.

Technology and administrative programs

Information Systems

In terms of information systems for monitoring praedial larceny and piracy in the fisheries sector, CARIFIS (Caribbean Information System) or similar systems are being utilized by fisheries departments. CARIFIS includes a registration and licencing and aquaculture components. The System can be modified to record data in relation to praedial larceny and piracy. Similar action can be undertaken when the regional database on IUU fishing is being addressed. These databases can be linked with any in public agencies involved the monitoring, surveillance and enforcement aspects of praedial larceny and piracy.

Vessel Monitoring (VMS) and other systems

There are a number of technologies that can be utilized in combating praedial larceny and piracy, with some of these being set out below.

"Pop-ups" may be used as a means to conceal the buoys marking the fish trap / fish pot positions. However, due to the uncertainty of the "pop-up" and with thieves still being to locate the traps, an increasing number of fishers are now setting traps "blindly" with GPS as locators, possibly accentuating the problem of ghost fishing. (<http://www.fao.org/docrep/008/y6982e/y6982e05.htm> and personal communication). As suggested by the Bermudan fishers, another method is to fill a small balloon with ink and place it on the ropes holding the fish pot or fish trap. So, when the pot is pulled out of the water and the rope is dragged across the side of a boat or winch, the balloon breaks covering the thieves and their vessel with ink.

Vessel Monitoring Systems (VMS) which utilize electronic transmitters to track the location of fishing vessels can be established. They can utilize smaller transmitters which can be embedded in the vessel and which will go unnoticed by thieves and pirates. Also, radio communication systems which allow fishermen to remain in contact with coast guard officials and radio for help in the event of an attack can be improved. VMS have proven their worth in monitoring, surveillance and controlling areas of ocean in North America and have even been used as admissible sources of evidence in law cases against illegal fishers.

Fishers can wear GPS wrist watches which will be used to indicate their locations when they radio for help. The use of the cell phone as a means of communication and location could be considered.

Onshore fishing facilities could be outfitted with electronic security systems, including close circuit televisions (CCTV) systems.

In all the above instances, the resources required to set up and maintain the systems would pose a major challenge. In the case of the development of VMS, a regional / sub-regional / national approach, utilizing nodes could be considered as a cost effective means of establishment, but ownership of data and its use in the courts, etc. would have to be addressed. VMS is becoming a very important tool in fisheries management, including MCS. Consideration can be given to the relevance of the mapping of praedial larceny and piracy hotspots in the EEZ and how this would inform the work of the Coast Guard (Draft Analysis of the State of Praedial Larceny in Member States of CARICOM, 2010).

IUU Fishing Catch Certification Schemes and SPS Certification

The EU Agriculture and Fisheries Council adopted a Regulation on 30 September 2008 establishing a Community system to prevent, deter and eliminate illegal, unreported and unregulated (IUU) fishing,

which went into effect from 1 January 2010. This includes as one of its main tools the establishment of a certification scheme covering all imports of fishery products. The aim is to halt the import of IUU fishery products into the EU. It places strong emphasis on checking, inspection and verification activities, 'to be carried out according to common criteria governed by risk management and assessment'. This would allow targeted trade flows to be controlled as a matter of priority (<http://agritrade.cta.int/en/Fisheries/Market-access-tariff-and-non-tariff-aspects/News/EU-IUU-fishing-regulation-catch-certification-scheme-scheduled-for-2010>).

To ensure the effectiveness of this scheme, fishery products can only be imported into the Community when accompanied by a catch certificate. The competent authorities of flag state country of the vessel catching the fish has to certify that the catches concerned have been made in accordance with applicable laws, regulations and international conservation and management measures. The certificate has to be validated by the competent authority of the flag state country, and if necessary, other documents envisaged by the certification scheme in the event of an indirect import after transshipment, transit or processing of the products in another third country. The catch certification scheme applies to all unprocessed or processed catches, except for freshwater fish, ornamental fish, aquaculture products obtained from fry or larvae or certain mollusks (<http://www.apfic.org/modules/xfsection/article.php?articleid=81>).

For example, such certificates include information on the name and license number of the fishing vessel, name and address of exporter, name of purchaser, transportation details and location of catch area. It also contains a section for sales notes from originator. The certificate must then be validated and countersigned by the appropriate government authority (www.catchcertificate.no).

In addition to the requirement for IUU Fishing catch certification, the EU also requires SPS certification for quality assurance with similar capacity to trace the fish and fish product back to the source. This also requires certification by a competent authority which must have adequate inspectorate and laboratory capacity to carry out its functions. In some instances, the competent authority for IUU Fishing Catch Certification and SPS Certification may be one and the same (e.g. DOF), but in others they may differ (e.g. MOH and DOF)

Since many countries in CARICOM export to or are in the process of arranging to export to the EU, including its Overseas Territories and have put in place or are in the process of putting in place such systems, they can be reviewed and modified as needed to play a role in the combating of praedial larceny and piracy as they offer the capability to trace the fish and fish products back to their source, with the necessary record keeping.

The challenges would come in ensuring that the agencies responsible have the necessary capacity to carry out its programs as well as put in place the necessary arrangements a from sea or fish farm at the community level to the market level. The role that fisherfolk organizations could play in the development and implementation of MCS and SPS programmes and in combating praedial larceny and piracy, including the management and maintenance of onshore facilities, should be determined and their capacities developed.

In aquaculture, the use of flood lights, static guards, dogs, and perimeter fencing is very popular across the region. Other farmers build housing on their fields where workers live permanently or semi-permanently, while others sleep near their harvest at the time close to maturity. Wire hooks, wooden stakes and barbed wire are all used in ponds as simple means of thwarting theft of farmed fish from aquaculture ponds. A combination of such security measures can be utilized. A major consideration in the utilization of security systems is the cost involved (Draft Analysis of the State of Praedial Larceny in Member States of CARICOM, 2010).

Public Awareness and Public Education

Strategies to enhance MCS in the region seek to develop increased public awareness and education as a means of preventing, deterring and eliminating IUU Fishing. This is intended to increase the public's understanding of the scope and severity of IUU fishing and to obtain the voluntary cooperation of fishers and the general public in complying with established legislation. Development of a comprehensive communication strategy and action plan to create awareness and educate the public about the effects of IUU fishing and praedial larceny and piracy will assist the fisheries authorities in promoting its agenda of providing safe and legally obtained fish and fish products to the consumer and for trade.

As recommended in the Draft Analysis Report, programs for praedial larceny (and piracy) should emphasize the risk that these crimes pose to continued investment in the sector, to health and to rural livelihoods. They should also promote successful measures against praedial larceny (and piracy). Public awareness and sensitization seminars should also present scenarios on praedial larceny (and piracy) to alert the public's awareness of when they may unknowingly be involved in these crimes on a regular basis and what actions they could take (Draft Analysis of the State of Praedial Larceny in Member States of CARICOM, 2010).

Resource Allocation

Based on available information, praedial larceny (and piracy in the EEZ) would appear to be a significant problem in the fisheries sector, including aquaculture. However, care should be taken to distinguish between praedial larceny and illegal fishing in the EEZ, even though they should both be addressed within the context of improved MCS.

Mindful of the economic significance of the fisheries sector to the region, resources must be allocated in order to address IUU fishing, praedial larceny and piracy, with such resources being provided to build MCS and SPS capacities among the relevant stakeholders; and the construction of or improvements to infrastructure at landing sites, including installation of secure storage areas with adequate security systems. Assistance should be made available to develop fishers' and aquaculturists' capabilities in employing the most appropriate technologies which prevent, deter or reduce praedial larceny.

References

Coche, A.G., Muir, J.F. and Laughlin, T. (1996). Simple Methods for Aquaculture: Management for Freshwater Fish Culture Ponds and Water Practices. Food and Agriculture Organisation of the United Nations.

CRFM. (2005). A Review of the Current Situation on IUU Fishing and MCS in the Fisheries Sector of the CARICOM/CARIFORUM Region. A Strategy for Enhancing the Effectiveness of MCS and a Proposal for a Project to Enhance the Effectiveness of MCS. 55 p. Unpubl.

Food and Agriculture Organisation. (2005). Fishery Country Profile: The Somali Republic www.fao.org/fi/oldsite/FCP/en/SOM/profile.htm Last retrieved 31 August 2010.

FAO/CDEMA. 2010. Draft Analysis of the State of Praedial Larceny in Member States of CARICOM,

Guyana Times February 22 2010 Fishing Industry Still Plagued by Piracy Guyana Times <http://119.82.71.95/guyanatimes/epapermain.aspx?queryed=9&querypage=1&boxid=112490&parentid=13534&eddate=02%2f22%2f10> Last retrieved 29 July 2010

<http://www.fao.org/docrep/008/y6982e/y6982e05.htm>
<http://agritrade.cta.int/en/Fisheries/Market-access-tariff-and-non-tariff-aspects/News/EU-IUU-fishing-regulation-catch-certification-scheme-scheduled-for-2010>
<http://www.apfic.org/modules/xfsection/article.php?articleid=81>
<http://www.catchcertificate.no>

Jentoft, S., Onyango, P., Islam, M. (2010). Freedom and Poverty in the Fishery Commons. *International Journal of the Commons* Vol. 4, No. 1

<http://www.thecommonsjournal.org/index.php/ijc/article/viewArticle/157/116> Last Retrieved 31 August 2010.

Little, D., Edwards, P. (2010). Integrated Livestock Fish Farming Systems. Food and Agriculture Organization of the United Nations. Inland Water Resources and Aquaculture Service

Malasha, Isaac. (2007). Food Security and Poverty Alleviation Through Improved Valuation and Governance of River Fisheries in Africa: The Governance of Small Scale Fisheries in Zambia. Worldfish Organisation. Malasha: The governance of small scale fisheries in Zambia. Last retrieved 20 September 2010

MarineBuz. <http://www.marinebuzz.com/2009/09/09/bae-systems-reveal-anti-sea-piracy-systems/> Ministry of Agriculture, Guyana, March 31 2008. Continued Efforts to Tackle Piracy <http://www.agriculture.gov.gy/Bulletins/March%202008/Continued%20efforts%20to%20tackle%20piracy.html> Last retrieved 31 July 2010.

Ministry of Agriculture Lands and Forestry Trinidad and Tobago
agri.gov.tt/home/images/pdf/Opportunities_and_Threats.pdf

Prædial Larceny (Prevention) Act faolex.fao.org/docs/pdf/jam70870.pdf

Stabroek News 30 June 2010 Government promises Fishermen Tech Aid in Piracy Battle <http://www.stabroeknews.com/2010/stories/06/30/gov%E2%80%99t-promises-fishermen-tech-aid-in-piracy-battle/> Last Retrieved 30 July 2010.

Stabroek News April 1 2008. Anti-piracy Revolving Fund Launched

<http://www.stabroeknews.com/2008/stories/04/01/anti-piracy-revolving-fund-launched/> Last Retrieved 17 September 2010

Squidoo 2010 Scallop Poacher Convicted Based on VMS Evidence <http://www.squidoo.com/vms-vessel-monitoring-system> Last retrieved 31 August 2010.

United Nations. 1982 Definition of Piracy United Nations Convention on the Law of the Seas Article 101 http://www.un.org/Depts/los/convention_agreements/texts/unclos/part7.htm Last retrieved 31 August 2010

United States coast Guard Navigation Center. Automated Identification Systems (AIS)
<http://www.navcen.uscg.gov/?pageName=AIS> Last Retrieved 16 September 2010.

Voice of America. <http://www.voanews.com/english/news/>

WTO. Sanitary and Phyto-Sanitary Measures: Text of the Agreement. World Trade Organisation.
http://www.wto.org/english/tratop_e/sps_e/spsagr_e.htm Last retrieved 20 September 2010