

# Report of the National Workshop on Monitoring, Control and Surveillance in Marine Fisheries

Sri Lanka

25 - 26 November, 2009  
Anuradhapura, Sri Lanka





**BAY OF BENGAL PROGRAMME**

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**Report of the National Workshop on Monitoring, Control  
and Surveillance in Marine Fisheries – *Sri Lanka***

**25-26 November 2009**

**Kalawewa, Anuradhapura, Sri Lanka**



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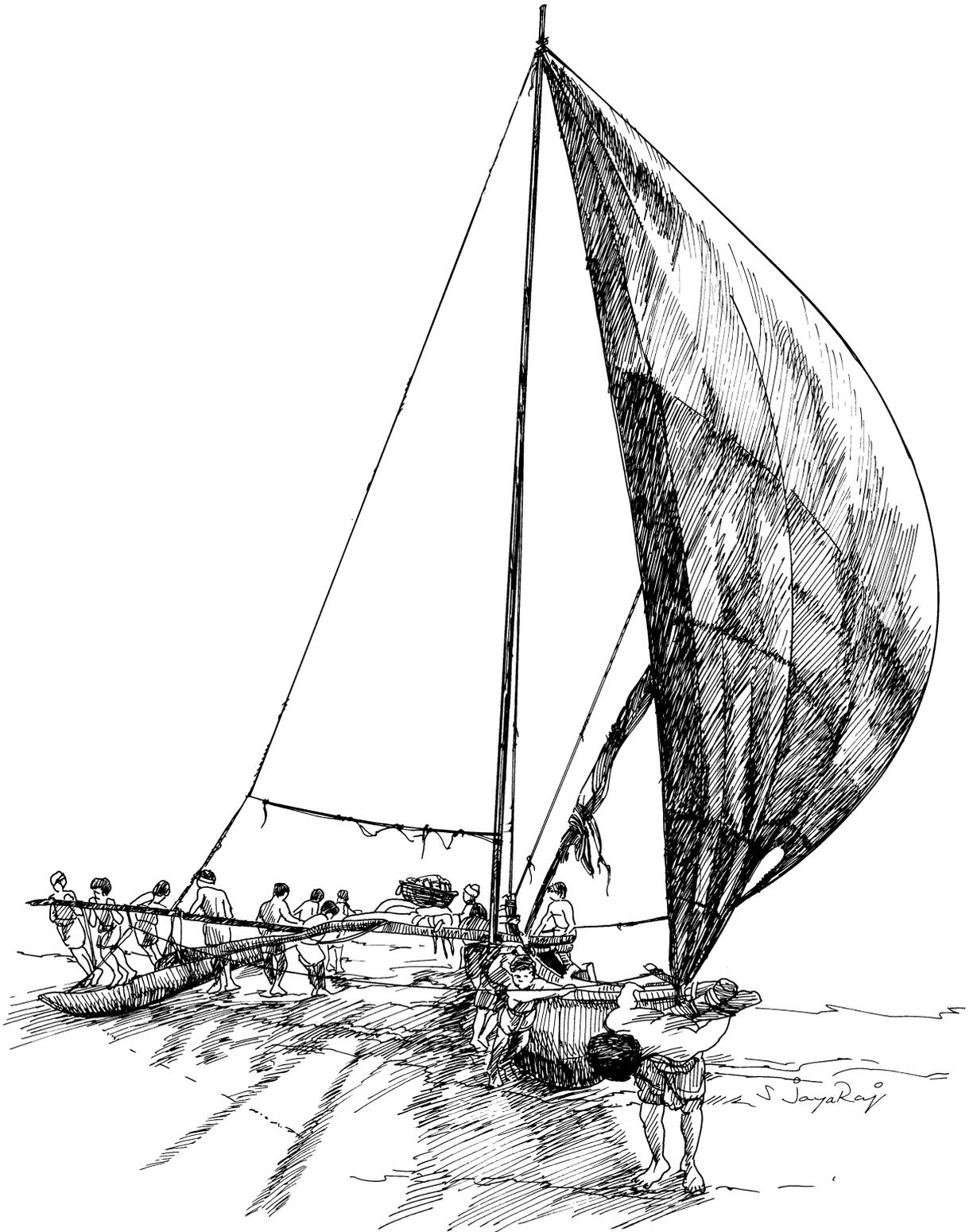
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## **Prospectus**

### **1.0 Background and rationale**

Marine capture fisheries play a pivotal role in sustaining and nourishing human civilization. It is an important source of food and nutrition and also a principle commodity of exchange for the coastal population since time immemorial. Notwithstanding the contribution of fisheries to the overall economy of many developing and developed nations, the sector's sustainability is now under severe threat for various reasons such as excess fleet capacity and consequent over-exploitation, increasing demand, natural and man-made impacts and lack of understanding on the ecosystem approach to fisheries management. As global research now shows, hope lies in changing the nature of fisheries governance from a by-standing and reactive to a proactive approach. Further, pursuant to the Third Round of discussions in the United Nations Convention on Law of the Sea, coastal states declared their Exclusive Economic Zones (EEZs) up to 200 miles from the coastline. While this sovereignty over the EEZ enabled the countries to expand their resource base many times, it also placed additional demands on them to protect and promote the health of the oceans under their jurisdiction. Strengthening and embedding the Monitoring, Control and Surveillance (MCS) mechanism in the fisheries governance to suit the changing scenario is now seen as an answer to achieve both these objectives.

In this backdrop, Sri Lanka, Maldives, India and Bangladesh – the four member-countries of the Bay of Bengal Programme Inter-Governmental Organisation (BOBP-IGO) came together in Chittagong, Bangladesh in January 2008 to review the resource conditions, country-specific activities in management and governance of marine fisheries sector and the scope of regional cooperation in sound management of the resources. The Regional Workshop unanimously adopted the '*Chittagong Resolution*' reiterating the commitment to protect the marine fisheries resources in a time-bound manner. The countries also realized the need to review and strengthen their existing MCS mechanisms to fulfill this commitment through the development of a National Plan of Action on MCS (NPOA-MCS).

In Sri Lanka, the fisheries sector contributes about 1.5 percent of the GDP (2007) and employs about 8.5 percent of total workforce and 27.2 percent of the workforce in agricultural sector. It is a major source of nutrition to about 21 million people and provides 55 percent of the animal protein intake and 34 percent of animal calorie intake of the population. The sector is a major foreign exchange earner and most importantly a major source of livelihood for about 600 000 people. However, in tune with the global trend, coastal fishery in Sri Lanka is also showing signs of stagnation. The marine fisheries sector, comprising coastal fisheries and offshore fisheries has recorded a modest growth of 2.5-3 percent per annum during the period 1980-2007. The return to labour in the sector has declined by about 44 percent during 1990-2007 while return to capital has declined by about 34 percent during the same period. These trends emphasize the need for strengthening the existing fisheries governance in Sri Lanka, for which a sound MCS mechanism is a pre-requisite.

## **2.0 The Proposed Workshop and its Justification**

The broad issues to be addressed by an effective MCS system in Sri Lanka can be identified as:

- *Developing the fishery sector in a responsible manner to ensure sustainability of the resources and livelihoods of small-scale fishers with special reference to the northern and north-eastern parts of the country;*
- *Finding cost-effective solutions for implementation of on-shore and at-sea monitoring systems;*
- *Preventing Illegal, Unreported and Unregulated fishing in Sri Lankan waters and discharging Flag State responsibilities;*
- *Ensuring traceability of fisheries products to its origin;*
- *Improving safety at sea for marine fishers;*
- *Developing and meeting human and physical assets requirement for a sound MCS regime;*
- *Addressing knowledge gaps in responsible fishing practices and on virtues of timely and factual data reporting;*
- *Addressing the requirements of international treaties and conventions to which Sri Lanka is a party;*
- *Prevention of pollution in marine waters, etc; and*
- *Involving fisher communities and developing regional cooperation in MCS.*

Being a small Island nation with a developing economy, MCS in Sri Lankan waters presents a range of unique problems. The proposed National Workshop on MCS (NW-MCS) will bring together stakeholders and practitioners from the government, fishers and NGOs alike. It will act as a stage for close scrutiny of the issues and finding consensus-based viable solutions.

## **3.0 Goal and objectives of the National Workshop**

The goal of the National Workshop is to develop NPOA-MCS for Sri Lanka. The objectives of the National Workshop are as follows:

1. Review of the existing fisheries management system (this will *inter alia* include scrutiny of registration and licensing procedure, gear regulation and monitoring and control of boat yards).
2. Assessment of the MCS capacity to identify institutional and physical requirements and means to address them.
3. Preparation of an outline of procedures and practical application of fisheries MCS programmes (the proposed Action Plan).

## **4.0 National Workshop**

The NW-MCS will be organized by the BOBP-IGO in coordination with the Ministry/ Department of Fisheries & Aquatic Resources (M/DFAR), Government of Sri Lanka. The Agenda & Timetable and Programme for the National Workshop is attached.

### ***Date and Venue***

The National Workshop will be organized from **25-26 November, 2009** at the National Inland Fisheries & Aquaculture Training Institute, Kalawewa, Anuradhapura, Sri Lanka.

### ***Conduct of the Workshop***

The National Workshop will be conducted in Sinhalese/Tamil and English. However, the proceedings of the Workshop will be brought out in English.

### ***Participation***

The National Workshop shall include about 45 -50 participants representing the (i) Ministry of Fisheries & Aquatic Resources Development (MFARD); (ii) Department of Fisheries & Aquatic Resources; (iii) Navy; (iv) National Aquatic Resources Research and Development Agency (NARA); (v) National Institute of Fisheries and Nautical Engineering (NIFNE); (vi) Other concerned Ministries/Departments/Agencies; (vii) Fishing and Allied Industries; (viii) Fisher and Fish Processor's Associations; (ix) NGOs; (x) FAO; (xi) NIOSH and (xii) BOBP-IGO. The List of Participants is attached.

### ***Format of the Workshop***

The National Workshop shall include four Technical Presentations on existing status of MCS in Sri Lanka and the requirements for its improvements. The presentations will lead to Group Discussions to analyze the situation and finalizing an action plan for consideration of the Government of Sri Lanka. Copies of the presentations and other documents shall be distributed to the participants prior to the Workshop.

### ***Coordination of Workshop***

The Director, BOBP-IGO will coordinate the National Workshop arrangements in consultation with the Director General (Development), MFARD, Government of Sri Lanka.

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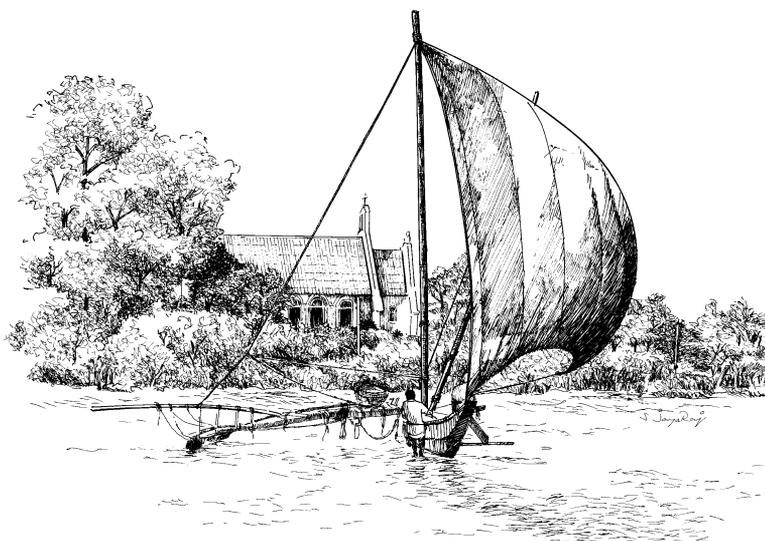
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**GoSL/BOBP-IGO National Workshop on  
Monitoring, Control and Surveillance,  
Anuradhapura, Sri Lanka, 25-26 November 2009**

### Agenda and Timetable

<b>25 November 2009 (Wednesday)</b>	
0830 – 0900	Registration
0900 – 0955	Session I - Opening Ceremony
<i>0955 – 1040</i>	<i>Tea/ Coffee Break &amp; Group Photograph</i>
1040 – 1230	Technical Session II - Presentation of Technical Papers
<i>1230 – 1345</i>	<i>Lunch Break</i>
1345 – 1515	Technical Session III - Group Discussion
<i>1515 – 1530</i>	<i>Tea/ Coffee Break</i>
1530 – 1700	Technical Session III contd...
<b>26 November 2009 (Thursday)</b>	
0900 – 1100	Technical Session IV - Group Presentations and Preparation of Draft Action Plan
<i>1100 – 1115</i>	<i>Tea/ Coffee Break</i>
1115 – 1230	Technical Session IV contd...
<i>1230 – 1400</i>	<i>Lunch Break</i>
1400 – 1530	Session V - Concluding Session
<i>1530 – 1600</i>	<i>Tea/ Coffee/ Departure of Participants</i>



*GoSL/BOBP-IGO National Workshop on  
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Anuradhapura, Sri Lanka, 25-26 November 2009*

## Programme

<i>24 November 2009 (Tuesday)</i>	<i>Arrival of the Participants</i>
<b>25 November 2009 (Wednesday)</b>	<b>Day 1</b>
<b>0830 - 0900</b>	<b>Registration</b>
<i>0900 - 0945</i>	<i>Session I: Opening of the National Workshop</i>
0900 - 0905	Lighting of the Traditional Lamp
0905 - 0915	Welcome and Introductory Remarks: Director, BOBP-IGO
0915 - 0925	Welcome and Introductory Remarks: Director General, Department of Fisheries & Aquatic Resources Development, Government of Sri Lanka.
0925 - 0935	Inaugural Address: Secretary, Ministry of Fisheries & Aquatic Resources Development, Government of Sri Lanka.
0935 - 0945	Vote of Thanks – Director, Ministry of Fisheries & Aquatic Resources, Government of Sri Lanka.
0945 - 1040	Group Photograph; Tea/ Coffee
<b>1040 - 1230</b>	<b>Session II: Technical Presentations</b>
1040 - 1110	Monitoring, Control and Surveillance of Marine Fisheries Resources in Sri Lanka: Guiding Principles and Practices – <i>Y S Yadava, Director, BOBP-IGO.</i>
1110 - 1150	The State of Marine Fisheries Resources and Fisheries Livelihood in Sri Lanka – <i>H P K Hewapathirana, Biologist, DFAR.</i>
1150 - 1230	Legal and Policy Support for Implementation of Monitoring, Control and Surveillance in Marine Fisheries Sector in Sri Lanka – <i>D S Nandasena, Assistant Director, DFAR.</i>
1230 - 1345	Lunch
<b>1345 - 1700</b>	<b>Session III - Group Discussion</b>
1345 - 1400	Formation of Groups/ Orientation
1400 - 1515	Groups Discussions
1515 - 1530	Tea/ Coffee
1530 - 1700	Group Discussions and Preparation of Group Reports.

<b>26 November 2009 (Thursday)</b>	<b>Day 2</b>
<b><i>0900 - 1230</i></b>	<b><i>Session IV – Group Presentations &amp; Preparation of Draft Action Plan</i></b>
0900 - 1100	Group Presentations
1100 - 1115	Tea/ Coffee
1115 - 1230	Finalization of the Group Recommendations and preparation of the draft Action Plan.
1230 - 1400	Lunch
<b><i>1400 - 1530</i></b>	<b><i>Session V: Concluding Session</i></b>
1400 - 1515	Presentation of Draft Action Plan and its Adoption.
1515 - 1525	Concluding Remarks: Chairperson
1525 - 1530	Vote of Thanks: BOBP-IGO
1530 - 1600	Tea/ Coffee
<b><i>1600 hrs onwards</i></b>	<b><i>Participants Departure</i></b>





**GoSL/BOBP-IGO National Workshop on  
Monitoring, Control and Surveillance,  
Anuradhapura, Sri Lanka, 25-26 November 2009**

**List of Participants**

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*Not to scale*

*GoSL/BOBP-IGO National Workshop on  
Monitoring, Control and Surveillance,  
Anuradhapura, Sri Lanka, 25-26 November 2009*

## **Report**

1.0 A National Workshop on Monitoring, Control and Surveillance in Marine Fisheries in Sri Lanka (NW-MCS) was organized by the Ministry of Fisheries and Aquatic Resources Development (MFARD), Government of Sri Lanka and the Bay of Bengal Programme Inter-Governmental Organisation (BOBP-IGO). The NW-MCS was held at the National Inland Fisheries & Aquaculture Training Institute, Kalawewa, Anuradhapura, Sri Lanka from 25-26 November 2009. Forty-three participants representing 15 national, regional and international fisheries organizations attended the NW-MCS.

2.0 The NW-MCS begun with the singing of ‘Sri Lanka Matha’ – the National Anthem of Sri Lanka. This was followed by *Lighting of the Traditional Lamp* by the dignitaries. Dr Yugraj Singh Yadava, Director, BOBP-IGO welcomed the participants and thanked the MFARD, Government of Sri Lanka for organizing NW-MCS.

Dr Yadava said that all the member-countries of BOBP-IGO (Sri Lanka, Maldives, India and Bangladesh) had earlier met in Chittagong, Bangladesh in January 2008 to review the status of fisheries MCS situation in the region. The Workshop concluded with the adoption of the ‘*Chittagong Resolution*’ that calls for strengthening of national MCS in a time-bound manner in all the member-countries. Taking follow-up action, National Workshops on MCS were organized in Bangladesh, India and Maldives to derive an Action Plan for implementing MCS in the respective countries. The present Workshop in Sri Lanka completes this first phase of the ‘*Chittagong Resolution*’. During the next phase, national action plans would be useful to monitor the progress achieved by the member-countries in implementing an effective MCS.

3.0 Mr S W Pathirana, Director General, Department of Fisheries and Aquatic Resources (DFAR) delivered the welcome address. Extending a hearty welcome to the delegates, Mr Pathirana said that the DFAR is responsible for implementing MCS in Sri Lanka and hoped that the proceedings and deliberations of the NW-MCS would address the problems pertaining to the implementation of MCS in Sri Lanka. He thanked BOBP-IGO for providing financial and technical support to conduct the Workshop and to Dr George A Conway, Director, Alaska Pacific Regional Office of the National Institute for Occupational Safety and Health (APRO-NIOSH) of the United States for participating in the NW-MCS. In conclusion, Mr Pathirana wished the participants a pleasant stay in Kalawewa.

4.0 Speaking in the Opening Session, Dr George A Conway thanked MFARD and the BOBP-IGO for inviting him to participate in the NW-MCS. He conveyed greetings from Director, NIOSH and wished the Workshop success. Dr Conway said that NIOSH is working in reducing fishing related mortalities for which a successful implementation of MCS is pre-condition. He hoped that the NW-MCS would address issues relating to safety of fishers during the deliberations.

5.0 Mr G Piyasena, Secretary, MFARD delivered the Inaugural Address. Expressing his happiness in participating in the Workshop, he said that the Hon’ble Minister of Fisheries and Aquatic Resources Development was expected to participate in the NW-MCS. However,



*Participants at National Workshop on MCS.*

due to political engagements, he could not attend the Workshop. On behalf of the Hon'ble Minister and himself, Mr Piyasena wished the NW-MCS all success.

Mr Piyasena said that in accordance with the '*Mahinda Chintana*' policy of His Excellency Mahinda Rajapaksha, the President of the Democratic Socialist Republic of Sri Lanka, necessary steps were being taken by the government to curb Illegal, Unreported and Unregulated fishing in the Exclusive Economic Zone (EEZ) of Sri Lanka. He said that the country has an EEZ of 517 000 sq. km declared under the Maritime Zone Law of 1976, and inshore waters comprising 45 major lagoons and estuaries with a total extent of 45 000 hectares. The MCS Division of the DFAR was established with the objectives of controlling fishing activities in the EEZ and rescuing marine fishermen and fishing vessels in distress. At present, DFAR has established 21 MCS centers along the coastal belt. This communication network consists of High Frequency and Very High Frequency Radio System and all Sri Lankan multiday fishing vessel are equipped with High Frequency Radio Communication sets & GPS equipment. The rescue of fishers in distress is handled by DFAR with assistance of Sri Lanka Navy, Sri Lanka Air Force, Ministry of Foreign Affairs, Sri Lankan Missions abroad, Colombo Radio Station, Coast Guards of foreign nations and the National Disaster Coordination Center.

Mr Piyasena said that introduction of a Vessel Monitoring System (VMS) is very important to have an effective MCS. Already necessary basic steps are being taken to establish a VMS in Sri Lanka. He hoped that the Workshop would deliberate on these issues and would come out with an implementable action plan.

6.0 Mr N Abeywickrama, Director (Planning & Monitoring), MFARD delivered the vote of thanks. He thanked the BOBP-IGO for assisting MFARD in organizing the Workshop. He thanked the delegates for taking time out of their schedule to attend the Workshop and wished them a pleasant stay in Kalawewa.

7.0 The Technical Session (Session II) began with the presentation made by Dr Y S Yadava on "*Monitoring, Control and Surveillance of Marine Fisheries Resources in Sri Lanka – Guiding Principles and Practices*". Dr Yadava said that the fisheries sector in Sri Lanka has significantly influenced the country's culture and society. The sector contributes about 1.5 percent to the GDP (2007) and employs about 27.2 percent of the workforce in agricultural sector. It is an important source of food and nutrition for about 21 million people. The sector is also a valuable foreign exchange earner and figures prominently in the national development strategy. However, in recent years, the coastal fishery is showing signs of stagnation. The return to labour in the sector has declined by about 44 percent during 1990-2007, while return to capital has declined by about 34 percent during the same period. These trends emphasize on the need for strengthening the existing fisheries governance in Sri Lanka, for which a sound mechanism of MCS is a pre-requisite.

Discussing the evolution of fisheries management system, Dr Yadava said that way back in 1988, the then Minister for Fisheries and now the President of Sri Lanka, Hon'ble Mahinda Rajapaksa had spelt out the need for awareness building, scientific management plan, conservation of marine environment and an adaptive sectoral development plan for the sector. Although, since then fisheries management system has gone through many transformations, these needs are still valid. The internationally accepted fisheries management philosophy *a la* United Nations Conventions on Law of the Sea and the 1995 Code of Conduct for Responsible Fisheries of the Food and Agriculture Organisation (FAO) of the United Nations

advocate that right to fish comes with the responsibility of sustainable fishing. The measures suggested in these global initiatives include adaptation of suitable measures to conserve fisheries resources by a country through: (i) collection of up-to-date information on the status of fisheries resources and fishing effort and sharing the same; (ii) monitoring and controlling fishing fleet plying in its waters or flying its flag; (iii) setting up an enabling framework to match exploitation of resources with its rate of regeneration or optimized yield; (iv) prevention of pollution and destruction of fisheries habitats by any method; and (v) building a transparent management system by involving stakeholders. The measures suggested in the international documents are the building blocks of an effective system of MCS for fisheries resources. It is distinctly different from the traditional MCS measures aimed at policing and revenue generation and which are generally considered as a failure to conserve fish stocks and manage fishing conflicts.

Analyzing implementation of MCS in the Sri Lankan context, Dr Yadava said that the government through its plans and proposals has shown its commitment to provide budgetary support for sustainable development of fisheries in the country. However, being a small island nation there is a limit to meet all the developmental expenditure by the government. Hence, there is a need to promote public-private partnership and cost recovery in the MCS system.

Dr Yadava then provided an analysis of trends in marine fisheries in Sri Lanka and detailed the following six lessons to determine the structure of MCS system in the country:

- (i) An effective MCS system in Sri Lanka is a basic necessity in view of the declining returns from fisheries, which possibly indicate worsening state of fisheries resources;
- (ii) Declining return from fisheries will negatively affect the wellbeing of fishers and ultimately the food and nutritional security of the country. Hence it is of utmost importance to develop an effective management system that ensures profitability of fishing operations as well as sustainability of the resources;
- (iii) A sound MCS system can be developed based on domestic budgetary allocations. Presently, the budgetary allocations for MCS are inadequate. However, given the existing directives in fisheries policy and political commitments, this situation can be changed;
- (iv) To make the MCS system sustainable, costs should be gradually transferred to the beneficiaries;
- (v) There is no 'thumb rule' or a single MCS solution for marine fisheries in Sri Lanka. While coastal fisheries will need closer and intensive monitoring, offshore fishing will require an extensive monitoring and surveillance system;
- (vi) Further, the large geo-spread of marine fishing operations increases the complexity of the MCS system. Ongoing infrastructural development programmes will address this problem to an extent but not completely. It is a serious policy challenge on how to effectively implement MCS in all the fish landing centres. Setting up of MCS on selective basis to only cover important fishing areas and landing points in the long-run may be self-defeating, as an uneven MCS regime will provide incentives to IUU fishing in weakly monitored areas.

Dr Yadava said that in the given situation, some of the main instruments that could be used for implementing MCS in Sri Lanka are (i) determining the level of sustainable exploitation and other relevant information by data gathering, assessment and analysis; (ii) controlling

(optimizing) fishing effort (e.g. through licensing, quota and rostering), especially in coastal waters; (iii) selecting appropriate management instruments to balance interests of fishers and other sectors; (iv) developing fisheries management plans based on precautionary principles; (v) enforcing controls in ports and at sea; (vi) adopting VMS, especially for the multi-day category of fishing vessels; (vii) educating the community through information dissemination; (viii) promoting co-management strategies and devolving rights to communities; and (ix) providing legislative support for fishery management plans and regulations to ensure equitable allocation of resources.

In this backdrop, Dr Yadava said that the proposed Action Plan should be based on a thorough review of the existing marine fisheries management programmes including registration and licensing procedure; analysis of fisheries in the territorial waters and the EEZ; assessment of the MCS capacity and identification of institutional development requirements within the M/DFAR and if necessary other concerned sister departments. Further, the Action Plan should also aim at strengthening of MCS Units in the MFARD; preparation of an outline of procedures and practical application of fisheries MCS programme and their implementation on pilot-scale basis; training of core MFARD/ Navy staff in MCS and development of manual/guidelines essential for implementation of MCS. He also suggested discussing modalities of organizing community groups at selected sites and their orientation for participation in the MCS and organization of hands-on workshops for the stakeholders.

In conclusion, Dr Yadava said that the ultimate objective of a MCS system in Sri Lanka is not only to protect the resources but to stabilize the sector, minimize occupational hazards and optimize policy benefits. In this regard, the state as a custodian of the resource should not hesitate in effectively implementing the 'Doctrine of Public Trust' and the 'Precautionary Principle'. A sound MCS system can be a win-win situation for both the government and the fishers as it would optimize the benefits accrued to all the parties concerned.

8.0 Dr (Ms) H P K Hewapathirana, Biologist, DFAR presented a paper on "*The State of Marine Fisheries Resources and Fisheries Livelihood in Sri Lanka.*" Dr Hewapathirana said that fisheries and aquatic resources of Sri Lanka include territorial waters of 21 500 sq. km and an EEZ of 5 17 000 sq. km. The country has a narrow continental shelf of 30 000 sq. km comprising 5.8 percent of marine area. Though Sri Lankan waters are rich in species diversity, the narrow continental shelf, with an average width of 22 km and the non-occurrence of upwelling limits the fisheries productivity of the country. The marine fishery sector of Sri Lanka comprises coastal fisheries and the offshore/deep sea fisheries. The marine fisheries sector has bounced back after being completely devastated by the December 2004 tsunami and after 2002 the marine fish production recorded a high of 3 19 120 tonnes in 2008.

Detailing the role of the coastal sub-sector in marine fish production, Dr Hewapathirana said that the country has adopted 'precautionary principle' to sustainably manage the fishery resources. According to the Fridtjof Nansen Survey (1979-80), the maximum sustainable yield (MSY) from the coastal area is 2 50 000 tonnes, comprising 1 70 000 tonnes pelagic fish and 80 000 tonnes of demersal fish. The highest production ever achieved in the coastal sub-sector was 1 84 049 tonnes in 1983 or 74 percent of the potential. Coastal fisheries accounted for 52 percent of the total fish production and employs 40 060 fishing crafts (93% of total) and about 80 000 fishers directly.

The offshore and deep sea fishery on the other hand is the fastest growing sub-sector of marine fisheries, said Dr Hewapathirana. She said that during 2007, offshore fisheries produced 1 02 560 tonnes of fish - 35 percent of the total fish production of the country employing 2 460 multi day fishing boats (IMUL).

The total number of fishing vessels in 2008 was estimated at 41 733 comprising 18 178 traditional non-motorized boats (NTRB), 2 959 motorized traditional boats (MTRB), 15 847 out-board engine fiberglass reinforced plastic boats (OFRP), 2 809 IMULs and 1 940 inboard engine single day boats (IDAY). Due to lifting of fishing barriers and the accelerated investment in offshore/deep sea fishing in the northern and eastern parts of the country, IMULs and IDAYs are going through rapid increase.

Dr Hewapathirana informed that Sri Lanka has not been able to make effective use of the high value deep sea dwelling tuna, lobsters and other fish stocks due to non-availability of vessels having requisite capabilities and is planning to promote long lining with vessels that have the required facilities to fish in the deep sea/offshore waters.

Explaining the information collection mechanisms, Dr Hewapathirana said that the Statistic Unit of MFARD obtains data from all the institutions under the purview of the Ministry. Fish landing data collected by the District Fisheries Inspectors are sent to the Statistical Unit. In addition, the National Aquatic Resources Research and Development Agency (NARA) collects information on offshore fisheries, especially of large pelagic varieties. Scientific sampling methods are being applied for data collection. Periodically, special census is also being conducted on fishing boats and fishing households under various externally-funded projects. Further, data on export of fish and fish products is gathered from the Customs Department.

In conclusion, Dr Hewapathirana said that fisheries management plays a major role in sustainable use of fishery resources. Hence data collection and analysis, participatory management planning, regulatory frameworks and input and output controls are essential.

9.0 Mr D S Nandasena, Assistant Director, DFAR, Kalutara District made a presentation on “*Legal and Policy Support to Implement Monitoring, Controlling and Surveillance in Marine Fisheries Sector in Sri Lanka.*” Mr Nandasena said that *Mahinda Chinthana* forms the basis of fisheries management programme in Sri Lanka. Based on *Mahinda Chinthana*, the MFARD has formulated a 10-year development policy for fisheries sector for 2006-16. The objectives of the fisheries policy are (i) to improve nutritional status and food security by increasing fish production; (ii) to minimize post-harvest losses and to improve fish quality; (iii) to increase employment opportunities and improve socio-economic status of fishing community; (iv) to increase foreign exchange earnings from fish products; and (v) to conserve the coastal and aquatic environment. In addition, *Mahinda Chinthana* specifically addresses MCS and identifies the need for improving collection of marine fish resources data as well as facilitating community participation through organizing and strengthening fisheries cooperative societies. The policy also identifies importance of efficient and effective Coast Guard service including VMS to combat IUU fishing to ensure sustainable fishing industry in the country.

Mr Nandasena said that the Fisheries & Aquatic Resources Act No 2 of 1996 is the main legal document concerning fisheries and aquatic resources in Sri Lanka. The main purpose of this Act is to manage, regulate and develop fisheries and aquatic resources. As per the Act, the DFAR is responsible to implement the Act and its Regulations. To implement the

provisions of the Act, the Department has deployed officers in all the 15 coastal districts of the country. Apart from DFAR officials, other officials who are authorized under the Act include (i) an officer of the Army, Air Force or Police not below the rank of Sergeant; (ii) an officer of Navy not below the rank of Petty Officer; and (iii) any officer authorized by the Director General of DFAR under section 46(1) of the Act. He said that the key regulations formed under the Act to ensure implementation of MCS are the Boat Registration Regulations of 1980; Fishing Operations License Regulations of 1996; regulations for boat registration imposed in Gazette No. 1430/4 on 30th January 2006; other regulations to control specific fisheries (lobster, chank, etc.) and regulations to declare fisheries management areas. As per the Boat Registration Regulations of 1980, no person is authorised to ply a fishing boat in Sri Lankan waters without a valid registration certificate. The registration is valid for a calendar year.

Mr Nandasena said that apart from registration certificate, a license would also be necessary to conduct a fishing activity. Section 6 of the Act specifies that no person can do fishing operations without a permit issued by the DG-DFAR or an authorized officer; Sections 7 & 8 of the Act set the permit, validity period and conditions and Section 9 holds that renewal of permit can be done only after verifying that the permit holder has complied with the conditions stipulated in the permit and there is no threat to fish and aquatic resources from the proposed fishing operation. He said that the Act also provides detailed criterion for registration of boatyards.

Discussing the rules and regulations for fisheries management, Mr Nandasena said that there are provisions for controlling fishing gear and curbing IUU fishing. In addition, a new regulation has been introduced to ensure safety at sea for fishers. Provisions also exist for declaring seasonal and area closure under the Act and if required the Minister of Fisheries and Aquatic Resources Development can also declare any fishing area as protected area. The other management measures under the Act include (i) size restrictions and closed season for lobster fishery to protect egg layers, etc; (ii) chank fishing permits; (iii) prohibition on use of mono-filament nets; (iv) restrictions on mesh size of purse seine; (v) ban on harmful fishing gear (push net, moxi net, etc); (vi) declaration of management areas and (vii) formation of management committees.





*Workshop participants engaged in Group Discussion.*

In conclusion, Mr Nandasena said that in spite of having a progressive legal and policy framework, various factors are affecting the efficacy of fisheries management in the country. These factors are open fishing access; poor community participation; inadequate capacity & resources for enforcement; poverty; lack of information and lack of proper mechanisms to address and review management issues on a continuous basis. He called for adequate allocation of resources and awareness building for involving the community in fisheries management.

10.0 Dr G A Conway discussed the experience of Alaska to ensure safety at sea for fishers and what lessons can be replicated in Sri Lanka. Dr Conway said that safety is a basic human right and since fishing is inherently risky it is necessary to undertake suitable measures to improve its safety rating. Dr Conway said that safety at sea is related closely with the surveillance part of MCS. Explaining the surveillance cycle, Dr Conway said that it comprises collection of data, consolidation and interpretation of data, dissemination of results, initiating action to control and prevent accidents leading again to collection of data after interventions. He said that every year about 25 000 fishers out of the estimated 36 million workforces die while fishing at sea in spite of technological advances in the field of life saving and communication. While developed countries have streamlined an effective Search and Rescue operation (SAR), developing countries are still lagging behind in popularizing the use of safety gear and streamlining SAR.

In conclusion, Dr Conway said that developing countries need to improve casualty surveillance, analysis and response; provide better training; adopt safety equipment and open information avenues in ports and villages on weather, health and safe fishing tips. The school curriculum in coastal areas should include lessons in sea safety as these can go a long way in preparing young fishers to inculcate safety habits when graduating into a mature fisher.

11.0 In Session III (Group Discussion), based on the technical presentations and the discussions that followed, the participants were divided into four groups to discuss the following four themes. The details of the topics discussed under each theme are enclosed as *Annexure 1*.

**Group I: Fisheries Information.**

**Group II: Legislative and regulatory requirements for MCS.**

**Group III: Operationalizing MCS.**

**Group IV: Rapport building, community mobilization and human resource development.**

12.0 Each Group was assisted by a facilitator who also moderated the discussions. The Group-wise list of participants is placed as *Annexure 2*. The second day of the Workshop began with the presentation on outcomes of Group Discussions, as shown in *Annexure 3*.

13.0 Dr Hewapathirana presented the report for Group I. The Group reported that no stock assessment survey was conducted at the national level during the last two decades, which placed an urgent need for evaluation of all fish stocks in the country. There is also a need for seasonal forecasting of fish stocks. The Group was of the view that the present data collection mechanism was not rigorous and suggested data collection for all landed species, introduction of log books, recruiting more officers for collection of data and building awareness among fishers on the importance of data reporting. The wrong apprehension among fishers on reporting of factual information should also be set right through awareness

drives. To improve the existing data collection mechanism the Group suggested creation of electronic data base, training of officers, conducting regular censuses, especially on fishing capacity and socio-economic indicators and building up a system of comprehensive data verification by cross-referencing information from fishers, weigh bridges at the landing centres, Customs, bank, and involvement of fisheries cooperatives. The Group also noted that information on issues like safety at sea and impact of climate change lacks coherence and suggested that more research should be carried out on such issues and information on fishing related accidents should be collected and reported in fisheries statistical handbook.

14.0 The Report for Group II was presented by Mr D S Nandasena. The Group evaluated the existing policies in terms of their adequacy, appropriateness and effectiveness and suggested that the use of logbooks should be compulsory as it would help in monitoring. The logbooks should include information on area of fishing, number of fishing days, type and quantity of fishing gear used, type and quantity of catch and amount of fuel consumed. The Group noted that the logbooks will provide detailed information and also allow for some checks on the mid-sea transfer of catch, especially by the multi-day boats. The Group after reviewing the existing registration and licensing procedures found that they were comprehensive and provisions did exist for data collection under the existing system. The Group noted the need for improving the surveillance mechanism in the country and found the existing legal framework to be inadequate in ensuring effective coordination among the concerned agencies. It also recommended rationalizing control measures and removing any discrepancy among different Acts related to conservation (*e.g.* between the Flora and Fauna Act and the Fisheries Act). The Group noted the need for zonation in marine waters – both from the perspective of multiple uses of the resource for various economic purposes and to reduce conflict among various types of fishing operations. The Group suggested introduction of legal provisions to cancel fishing license of those engaged in illegal fishing within the EEZ of Sri Lanka and/ or in foreign/ international waters. The Group also suggested formation of a committee under the aegis of BOBP-IGO to monitor the progress of implementation of effective MCS system in the region.

15.0 Ms A H S Ediriweera, Socio-economist with DFAR presented the Report for Group III. The Group suggested commissioning of weigh-bridges at landing sites for correct estimation of landings. The Group felt that the strength of the existing MCS Division within the DFAR was inadequate and felt that lack of human resources, both in numbers and quality would be a major hindrance in implementation of an effective MCS system in Sri Lanka. Similarly, lack of qualified personnel to implement the provisions of the Rules and Regulations on boatyards can compromise quality of construction of boats, which can be a serious issue for safety of fishers at sea. The Group suggested that insurance, which is presently compulsory for multi-day boats, should be mandatory for all type of fishing vessels and crew. The Group found that lack of VMS had weakened surveillance of IUU fishing in Sri Lankan waters. The Group also recommended a budgeting exercise to estimate the needs of the sector.

16.0 Mr H S Hathurusinghe, FAO National Training Consultant presented the findings of Group IV. The Group first identified the stakeholders in the fisheries sector and their role. The Group felt that presently an enabling relationship exists between the fishers and the government - the fishers provide valuable food and nutrition to the nation and the government provides the required institutional and resource support to carry out fishing activities. The Group suggested promotion of co-management to encourage community participation and also observed the need to adopt new technologies for MCS and VMS. The Group

recommended launching of an awareness drive and inclusion of NGOs in the activities to achieve the objectives.

17.0 Based on the recommendations of each Group, a draft Action Plan on Implementation of MCS in Sri Lanka was presented by Dr Yadava. The draft Action Plan was discussed and valuable suggestions were made by the participants. Based on the suggestions, the final Action Plan was adopted by the National Workshop. The Action Plan is placed as *Annexure 4*.

18.0 Summing up, Dr Yadava said that he was satisfied with the discussions and outcome of the National Workshop. Complimenting the Government of Sri Lanka on completion of the NW-MCS, Dr Yadava said that the Action Plan was comprehensive and its implementation would contribute to the sustainable development of the marine fisheries resources in Sri Lanka.

19.0 In the Concluding Session, Mr G Piyasena, chairperson said that the NW-MCS was productive in reviewing the status of MCS in Sri Lanka and identifying areas that required improvements. He said that a time bound action should be initiated to implement the Action Plan. He thanked the BOBP-IGO for its contribution to make the NW-MCS successful. In conclusion he thanked all the participants and declared the NW-MCS closed.

20.0 Mr Manoj Priyankara Govinnage proposed the vote of thanks. He said that the Workshop was successful due to constant monitoring and guidance provided by Secretary, MFARD and DG, DFAR. He thanked all the participants for their active participation and BOBP-IGO for their cooperation.

21.0 The Report of the NW-MCS was adopted on 26 November 2009.



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**Details of Topics for Group Discussions**

Group I	Group II	Group III	Group IV
Fisheries information	Legislative and regulatory requirements for MCS	Operationalizing MCS	Rapport building, community mobilization and human resource development
<ul style="list-style-type: none"> <li>• Status of fish stocks: what is there and what should be there.</li> <li>• Real time monitoring of fish stock: scope and need.</li> <li>• Methods of data collection: existing gaps and measures to approach them.</li> <li>• Data reliability: gaps and measures to improve existing data collection and reporting – both qualitatively and quantitatively.</li> <li>• Setting up of reference points.</li> <li>• Measuring fishing capacity: what is there and what should be there.</li> <li>• Socio-economic information: existing procedures and measures to improve.</li> <li>• Voluntary reporting of data: scope, constraints and measures to be taken.</li> </ul>	<ul style="list-style-type: none"> <li>• Scope of existing laws and regulations to implement MCS (discussions on existing registration and licensing procedure, fees, etc).</li> <li>• Inter-Ministry/Departmental cooperation: present status, gaps and measures to improve cooperation.</li> <li>• Fishing vessel registration: existing criteria, gaps if any in respect of monitoring and safety at sea.</li> <li>• Zonation of marine waters: necessity, measure to be taken and identification of practical constraints.</li> <li>• Integrating safety at sea into fisheries management.</li> <li>• Measures to control destructive fishing: Review of existing measures on mesh size and destructive gear and need for modification, problem of implementation, process for conviction and punishment for violation.</li> </ul>	<ul style="list-style-type: none"> <li>• Existing MCS measures and problems faced to implement them.</li> <li>• State of fisheries infrastructure: existing capacity, required capacity, measures to consolidate fishing operations, financing and pricing of operations.</li> <li>• State of boatyards: registration and quality control.</li> <li>• State of communication system: Type of communication used by various categories of fishing vessels, measures to facilitate location and identification of fishing vessels at sea, measures to facilitate two-way communication between land and boat.</li> <li>• Measures to improve safety at sea for fishers: navigational training, carrying and using LSA, communicating weather forecast.</li> </ul>	<ul style="list-style-type: none"> <li>• Identifying all stakeholders important for setting up MCS and defining their roles.</li> <li>• Existing bonding between government and fishers and measures to improve it.</li> <li>• Existing scope of involving the fishers in MCS and measures to improve it.</li> <li>• Human resource development: training requirements for DFAR staff and other stakeholders.</li> <li>• Building awareness: efficacy and reach of existing methods and improving it further.</li> <li>• Information flow between researchers and fishers regarding important fisheries variables and emerging issues like declining stocks and changing climate.</li> <li>• Role of NGOs and efficacy of donor funded projects.</li> </ul>

Group I	Group II	Group III	Group IV
<b>Fisheries Information</b>	<b>Legislative and regulatory requirements for MCS</b>	<b>Operationalizing MCS</b>	<b>Rapport building, community mobilization and human resource development</b>
<ul style="list-style-type: none"> <li>• Taxonomy: problems of identification and interventions needed.</li> <li>• Readiness to address emerging issues like changing climate.</li> <li>• Reporting: existing measures, international requirements and bridging the gap.</li> </ul>	<ul style="list-style-type: none"> <li>• Controlling IUU fishing.</li> <li>• Measure to optimize fishing effort, especially in the coastal waters.</li> <li>• Measures to ensure governmental (legislative and budgetary) support to MCS.</li> <li>• Developing regional cooperation.</li> </ul>	<ul style="list-style-type: none"> <li>• Identification of suitable procedures for vessel monitoring.</li> <li>• Estimating financial and human resource requirements for MCS.</li> <li>• Identifying methods of financing (government, public-private, donor) and cost recovery.</li> <li>• Insurance for fishers and fishing vessels.</li> </ul>	<ul style="list-style-type: none"> <li>• Involving other stakeholders in MCS: pros and cons, procedures to involve, incentives necessary for involving.</li> <li>• Attributes of the community: whether devolution of power is possible, extent of devolution, possibility of co-management.</li> </ul>

**GoSL/BOBP-IGO National Workshop on  
Monitoring, Control and Surveillance,  
Anuradhapura, Sri Lanka, 25-26 November 2009**

**Annexure 2**

**Group-wise List of Participants**

Group I	Group II	Group III	Group IV
<b>Fisheries information</b>	<b>Legislative and regulatory requirements for MCS</b>	<b>Operationalizing MCS</b>	<b>Rapport building, community mobilization and human resource development</b>
<ul style="list-style-type: none"> <li>• Nimal Abeywickrama</li> <li>• Sepalika Wickramasinghe</li> <li>• H P K Hewapathirana</li> <li>• N D P Gunawardane</li> <li>• M Marcus</li> <li>• S Ganeshamoorthy</li> <li>• P R P D Dayarathne</li> <li>• N B P Punyadeva</li> <li>• Percy Samarasinghe</li> <li>• R P P K Jayasinghe</li> <li>• Manoj Priyankara Govinnage</li> </ul>	<ul style="list-style-type: none"> <li>• G Piyasena</li> <li>• Indra Ranasinghe</li> <li>• Kumari N Vithana</li> <li>• D S Nandasena</li> <li>• M M W Ranjith Bandara</li> <li>• S Samarawickrama</li> <li>• Bandula Siyambalapatiya</li> <li>• O Sagara Silva</li> <li>• E A K Sumith Kumara</li> <li>• A P Mallikarachchi</li> </ul>	<ul style="list-style-type: none"> <li>• S W Pathirana</li> <li>• Jayantha Weerakoon</li> <li>• A H S Ediriweera</li> <li>• H J M Nihal Palitha</li> <li>• H A Kulathunga</li> <li>• S H Jayasekara</li> <li>• S B Jagath Chamrika</li> <li>• E A R Perera</li> <li>• Ranjith Senaratne</li> <li>• Sumith de Silva</li> <li>• A J Munsinghe</li> </ul>	<ul style="list-style-type: none"> <li>• U L S Kumudini</li> <li>• A D P C Wijegoonawardane</li> <li>• W S Lal de Silva</li> <li>• M A Premawansa</li> <li>• K Selvaraj</li> <li>• Y K M T B Senarath</li> <li>• Kapila Balasooriya</li> <li>• A T Manjula Priyashantha</li> <li>• P U I Perera</li> <li>• K D Liyanage</li> <li>• H S Hathursinghe</li> </ul>

**Group-wise Recommendations**

Group I	Group II	Group III	Group IV
Fisheries Information	Legislative and regulatory requirements for MCS	Operationalizing MCS	Rapport building, community mobilization and human resource development
<ul style="list-style-type: none"> <li>• Survey and assessment of fish stocks (small and large pelagics and demersal fish stocks.).</li> <li>• Regular monitoring of vulnerable fish stocks.</li> <li>• Seasonal predictions and forecasting of fish stocks using historical data and understanding patterns and trends.</li> <li>• Collection of landing data and export figures on regular basis.</li> <li>• Introduction of logbooks for mechanized crafts and involving fishers in data collection.</li> <li>• Recruiting more officers.</li> <li>• Building awareness of fishers about the importance of data and to nullify any apprehensions for reporting correct data.</li> <li>• Training on species identification, onsite data collection, etc and provision of transport facility to officers.</li> </ul>	<ul style="list-style-type: none"> <li>• Maintenance of log books should be mandatory.</li> <li>• The logbook should include information on aspects such as area of fishing; number of fishing days; type and quantity of fishing gear used; quantity of catch and type of species and amount of fuel consumed.</li> <li>• Introduce legal measures to ensure cooperation among concerned agencies.</li> <li>• Improved cooperation in the field of surveillance with the establishment of the SL Coast Guard Department.</li> <li>• Rationalize the fine specified in the Fisheries Act in line with the Fauna and Flora Act.</li> <li>• Delineate marine waters for competing uses under the Fisheries Act.</li> </ul>	<ul style="list-style-type: none"> <li>• Commission weighbridges in harbours.</li> <li>• Provide adequate resources (human and physical).</li> <li>• Introduce VMS system.</li> <li>• Provide personnel for boatyard certification (MEA).</li> <li>• Communication system available only in IMUL boats (GPS, VHF, etc) and vast majority of vessels not equipped with communication equipment. Measures should be taken to provide communication in all boats.</li> <li>• VHF and GPS should be mandatory for all vessels.</li> <li>• Provide training on maritime safety.</li> <li>• Prepare a joint action plan involving Ceylon Fishery Harbour Corporation, DFAR,</li> </ul>	<ul style="list-style-type: none"> <li>• Educate the stakeholders about present global fisheries situation and new technologies available for implementation of MCS.</li> <li>• Improve knowledge on eco-friendly fishing methods.</li> <li>• Create awareness and provide facilities to reduce post-harvest losses.</li> <li>• Create awareness on safety at sea; impact of illegal fishing methods and navigation technology.</li> <li>• Improve existing MCS system by introducing VMS, fish finding system &amp; strengthening of institutions.</li> <li>• Ensure uninterrupted and timely flow of knowledge on catch, stock, price, climatic changes, fishing fleet, fishing grounds between research and other government institutions and the fishers.</li> </ul>

Group I	Group II	Group III	Group IV
<b>Fisheries information</b>	<b>Legislative and regulatory requirements for MCS</b>	<b>Operationalizing MCS</b>	<b>Rapport building, community mobilization and human resource development</b>
<ul style="list-style-type: none"> <li>• Cross-checking of landing site data and commissioning of weigh-bridges at landing sites.</li> <li>• Crosschecking of wholesale market data and district-wise production.</li> <li>• Using data from approved processing plants and Customs for cross-checking export related information.</li> <li>• Collecting information on per capita consumption/demand of fish.</li> <li>• Regular fisheries census by DFAR.</li> <li>• Assigning data collection work to Fisheries Cooperative Societies.</li> <li>• Introduction of value chain analysis.</li> <li>• Usage of common names of fishes for data collection.</li> <li>• Developing species identification catalogue, guidelines, leaflets, posters.</li> <li>• Improved weather forecasting.</li> <li>• Improved radio communication systems/networks.</li> <li>• Furthers research on ocean level rise and impact of climate change.</li> <li>• Involvement of Ministry of Disaster Management.</li> <li>• Maintaining an electronic data base.</li> <li>• Dissemination of data to related bodies and sharing of data with regional bodies.</li> </ul>	<ul style="list-style-type: none"> <li>• Introduce competence certificate for skippers.</li> <li>• Control destructive fishing.</li> <li>• Introduce legal provisions to cancel fishing license of those engaged in IUU fishing in domestic or foreign waters.</li> <li>• Establish a regional committee under the BOBP-IGO.</li> </ul>	<p>Navy, Sri Lanka Coast Guard, for vessels monitoring</p> <ul style="list-style-type: none"> <li>• Presently, only IMUL boats are insured. Insurance should be made mandatory for all vessels and crew.</li> </ul>	<ul style="list-style-type: none"> <li>• NGOs should be involved to help awareness creation, implementation of MCS, share/provide international technology to improve MCS and to act as interface between the implementing agencies and the fishers.</li> <li>• Provide necessary navigational equipment.</li> <li>• If possible, fisheries management should be included in the school curriculum.</li> <li>• Delineate certain powers to the community to implement MCS.</li> <li>• Co-management system can also be implemented as it has already started to some extent in certain areas.</li> </ul>



35-M342

## **National Plan of Action for Implementation of Monitoring, Control and Surveillance in Marine Fisheries in Sri Lanka**

### **A. Monitoring**

#### ***I. Improving fisheries information system***

- Marine fish landings should be estimated regularly on the basis of a scientifically designed programme. The monitoring of fish landings should include data on various biological aspects of commercially important species caught in the national waters.
- Survey and assessment of fish stocks (small and large pelagics and demersal species/stocks) should be carried out and vulnerable fish stocks should be monitored regularly. The use of commercial data to arrive at conclusions on fish stocks should be discouraged.
- Work should be undertaken for predicting seasonality of fish stocks using historical data.
- Fishing capacity should be estimated using scientific methods. Census of fishing vessels should be carried out regularly (*e.g.* at every 5 year interval).
- Regular census should also be carried out to know the condition of fishers. This data should be corroborated by undertaking sampling studies and periodical interviews with the fishers. Consultations may also be held with the Department of Census and Statistics to include fisheries-related information in their regular country-wide census programmes.
- Value-chain analysis and estimation of per capita supply and consumption of fish and fishery products should be undertaken.
- There should be regular exchange of information on fish stocks and fishing effort with the concerned regional and international agencies.

#### ***II. Strengthening collection of fisheries information***

- Besides ongoing programmes for collection of statistics on fish landings, it should also be made mandatory for fishing vessels to file log sheets containing information on species-wise catch, area of operation, effort deployed, fuel used, etc after each fishing trip to the designated authority. In the beginning this requirement may be restricted to the mechanized fishing vessels. The logbooks should be user-friendly and easy to fill-up by the fishers.
- The data collected from such sources should be cross-verified with other sources like export figures, wholesale market transaction data, customs data, etc. There should be regular collection of secondary data from these other sources.

- Weigh-bridges should be installed in all the fishing harbours to measure the landings reliably and also for verification of data collected through other sources at the fishing harbour.

### **III. Training and awareness**

- Recognizing that there is problem in species identification, training of fisheries officials should be undertaken to build their capacity in fin and shell-fish taxonomy.
- Further, posters, handbooks and catalogue of fish species using their local, common and scientific names should be prepared to facilitate identification of fin and shell fish species.
- The capacity building of the staff of Ministry of Fisheries & Aquatic Resources Development/Department of Fisheries & Aquatic Resources (M/DFAR) and other concerned organizations should be initiated in a planned manner. A Gap analysis may be undertaken to arrive at the actual capacity building needs in all spheres of fisheries management in general and Monitoring, Control and Surveillance (MCS) in particular. Accordingly, if needed more personnel should be recruited for MCS purposes.
- Awareness programmes should be undertaken to mobilize fishers for sharing fisheries related information. In this regard it may be necessary to allay their fears/apprehensions, if any (*e.g.* on increased taxation, etc) as this would facilitate flow of accurate information from the fishers on fish catches and other attributes of the fisheries resources.
- The local fisheries organisations including Fisheries Cooperative Societies should be actively involved in data collection and other activities concerning flow of information from fishers to the government and *vice versa*.

### **IV. Safety at Sea**

- The existing mechanisms for recording accidents at sea are inadequate to ascertain the exact causes. The MCS Units need to be strengthened in terms of manpower and a reporting procedure should be put in place to record fishing-related accidents at sea. This would enable planning for suitable interventions and subsequent reduction in accidents.
- Similarly, monitoring of boatyards should be strengthened by deploying required manpower to ensure that the boats are constructed as per approved standards.
- It is mandatory that fishing vessels carry adequate Life Saving Appliances, First Aid and Fire Fighting Devices wherever applicable. There should be complimentary surveillance mechanism to ensure that this legal requirement is fulfilled by the fishing vessels.
- It should be mandatory for all fishing vessels, except small-non-mechanized artisanal coastal fishing vessels, to carry communication equipment, depending on their size and area of operation.

- There should be training in maritime safety and awareness programme should be organized on regular basis to improve the safety at sea for fishers. Also more resources should be deployed to provide Search and Rescue inputs.
- Safety, like MCS, is also an integral part of fisheries management. There should be certification for skippers on navigational skills and other aspects of safety at sea.

#### **V. *Addressing unforeseen events***

- To address the threats posed by changing climate, weather forecasting methods need to be improved. It is also necessary to improve radio communication system of the DFAR so that the fishers can be regularly informed on weather bulletins and other weather-related developments.
- The Ministry of Disaster Management and M/DFAR should work together closely to measure the threats of changing climate and promote further research, especially on adaptation measures necessary in view of the impacts of climate change on the fisheries resources and coastal ecology.

### **B. Control**

#### **I. *Infrastructure Development***

- Considering the need to minimize post-harvest losses and to improve hygienic handling of fish at the fishing harbours, anchorages and fish landing centres, the concerned agencies operating the facilities should adopt and implement hygienic practices so as to conform to international standards for food safety.
- The sustainable management and development of the infrastructure created by the government may necessitate full involvement of the primary stakeholders (beneficiaries) using the facilities. In this regard their involvement in operation and management of fisheries infrastructure may be considered. For this reason, a Harbour Development and Management Plan should be developed and pilot-scale projects may be initiated to understand the procedure of involving beneficiaries in operation of fisheries infrastructure. The lessons learnt may subsequently be replicated on a wider-scale in the country.

#### **II. *Zonation of marine waters***

- Keeping in view the versatile use of marine waters (including coastal areas), there is an urgent need to demarcate the coastal areas for different uses based on key parameters of ecology, heritage, sensitivity and developmental needs.
- Similarly, keeping in view the diversity of the fishing fleet and their degree of mechanization, the marine waters should be zoned for different categories of fishing vessels. Such a zonation is likely to reduce conflicts amongst fishers and also help in sustainable utilization of the fisheries resources, especially from the coastal waters, which are now over-fished. The categorization may also keep in mind the safety requirements of different types of fishing vessels.

### **III. *Review of Fisheries Legislation***

- Existing fisheries legislation should be reviewed based on their adequacy, appropriateness and effectiveness to address MCS issues. Such legislation should be compatible with the provisions of the other relevant Acts (*e.g.* the Fauna and Flora Act).
- There should be a ‘Coordination Body’ involving the relevant Ministries/Departments to address cross-cutting issues concerning fisheries sector.

### **IV. *Fisheries policy and management frameworks***

- Adequate provision of funds for implementation of MCS and other fisheries management measures is a pre-requisite. The Government should ensure that adequate budgetary provisions are made to cover the requirements of logistics, manpower, surveillance, human resource development, etc.
- Similarly, cost-benefit analysis should be carried out to rationalize the user fees (registration, licensing, berthing facilities, etc.) charged for services provided by the government.
- Destructive and Illegal, Unreported and Unregulated fishing practices need to be curbed. The existing policy and legal frameworks need further strengthening to control and eliminate such fishing practices.

### **V. *Capacity building and empowerment***

- The M/DFAR are the nodal agencies for fisheries development. Therefore, it should be ensured that the M/DFAR are adequately staffed in terms of trained technical manpower to address the issues of sustainable fisheries development.
- The fishing community, as the grassroots practitioners of fisheries, should be empowered to participate in fisheries management programmes. For this purpose training and awareness programme should be undertaken to improve their skills and co-management of resources should be promoted. In this regard the ‘Principle of Subsidiarity’ may be adopted.
- The socio-economic well-being of the fisher community should be improved and their safety nets should be strengthened by providing additional livelihoods.
- Insurance of fishing vessels should be encouraged to envelope all fishing vessels.
- Mechanisms should be established to allow regular flow of information from government and research organizations to fishers and *vice versa* to build informed stakeholders.

### **C. *Surveillance***

- Presently, the Navy is the key agency for surveillance. To ensure that the important task of surveillance is carried out properly, the Navy needs to be strengthened both in terms of manpower and wherewithal.
- Strengthening of Coast Guard, DFAR, Police and other agencies involved in surveillance should also be considered. This would ease the burden of the Navy in the long-run and would also enable the Navy to concentrate more on the defense needs of the country rather than on monitoring and surveillance of civilians in peace-time settings.

- There should be a suitable Vessel Monitoring System (VMS) for the multi-day fishing vessels operating in the Sri Lankan EEZ. To design a suitable VMS, all the relevant agencies: Navy, M/DFAR and other Departments should work out a suitable strategy, including the hardware and software components of the VMS meeting international requirements.
- The involvement of stakeholders (*e.g.* fishers) is crucial for effective surveillance both at port and at sea. Emphasis may be laid on shore-based MCS programmes with greater community participation.
- A Regional Coordination Body involving the neighboring countries should be constituted under the aegis of the Bay of Bengal Programme Inter-Governmental Organisation to deal with matters related to MCS.





## **Monitoring, Control and Surveillance of Marine Fisheries Resources in Sri Lanka – Guiding Principles and Practices<sup>1,2</sup>**

### **1.0 Introduction**

Sri Lanka, situated on the western borders of the Bay of Bengal in the Indian Ocean is often referred to as ‘the Venerable Island’. The origin of civilization in the Island dates back to pre-historic era and stories of its awe-inspiring wealth are vividly depicted in the Indian epic - the *Ramayana*. The Island is also known for its vibrant bio-diversity and rich natural resources.

Post-independence, Sri Lanka achieved commendable social development as captured in the relatively higher values of Human Development Index published by the United Nations. The country, in particular, has been successful in spreading education and health to its citizens. However, the economy is yet to fully capture the success in social sectors and more than 1/3<sup>rd</sup> of the labour force earns its living from the primary sector (agriculture, forestry and fisheries) (Statistical Pocket Book-2009).

Sri Lanka’s economic growth has been much hampered by the three decade-long civil strife. It led to deployment of considerable financial and human resources for military purposes. The end of the conflict in May 2009 is now being seen as light at the end of tunnel and is expected to bring inclusive and holistic development in the country.

The landscape of Sri Lanka is quite diversified. It has a total area of 65 610 sq. km, with 62 705 sq. km of land and 2 905 sq. km of water and a coastline of 1 620 km. The landmass to sea area ratio of Sri Lanka is about 1 to 8. The country has an Exclusive Economic Zone (EEZ) of 517 000 sq. km and territorial waters of 30 000 sq. km. Sri Lanka’s climate is influenced by the northeast monsoon (December to March), and the southwest monsoon (June to October). Its terrain is mostly low, flat to rolling plain, with mountains in the south-central interior.

Owing to the vast marine and inland water resources, the fisheries sector in Sri Lanka has been instrumental in shaping the country’s culture and society. The sector contributes about 1.5 percent to the GDP (2007) and employs about 27.2 percent of the workforce in agricultural sector. It is an important source of food and nutrition for about 21 million people. The sector is also a valuable foreign exchange earner and figures prominently in the national development strategy.

The marine fisheries sector in Sri Lanka, comprising coastal fisheries and offshore fisheries, has recorded a modest growth of 2.5-3.0 percent per annum during the period 1980-2007. However, in recent years, the coastal fishery is showing signs of stagnation. The return to labour in the sector has declined by about 44 percent during 1990-2007 while return to capital has declined by about 34 percent during the same period. These trends qualify the

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<sup>1</sup> *Dr Yugraj Singh Yadava, Director, Bay of Bengal Programme Inter-Governmental Organisation.*

<sup>2</sup> *Mr Rajdeep Mukherjee, Policy Analyst, Bay of Bengal Programme Inter-Governmental Organisation.*

need for strengthening the existing fisheries governance in Sri Lanka, for which a sound mechanism of monitoring, control and surveillance (MCS) is a pre-requisite.

## **2.0 MCS in context: national and international commitments**

In 1998, while addressing the 23<sup>rd</sup> Advisory Committee of the former Bay of Bengal Programme (BOBP) in Negombo, Sri Lanka, the Sri Lankan President Hon'ble Mahinda Rajapaksa (the then Minister of Fisheries and Aquatic Resources Development) spelled out the following four challenges confronting fisheries resource development in Sri Lanka:

*“The first is the lack of awareness on the importance of fisheries as a source of food, job and economic growth and promoting this understanding should be the pre-requisite for all other steps to follow.*

*Second, an effective fisheries management system, which ensures sustainability of coastal resources and brings about a recovery of depleted stocks so that the highest possible benefits go to the fishing communities.*

*Third is the preservation of the aquatic environment, which is affected by illegal activities, discharge of waste, pollution and coastal migration impacting fisheries and other resources such as mangroves, sea grass beds, coral reefs and estuaries, which are biologically the most productive and the most ecologically diverse aquatic environments.*

*Lastly, the need to formulate and implement sound sector development plans to ensure that development be more orderly, realistic and rational and, in particular, take into account the lessons we have learnt in the past.”*

Reflecting this vision, the National Fisheries and Aquatic Resources Policy of 2006 stated that precautionary approach would be applied in fisheries governance. Further, the principles of responsible fisheries as stipulated in international conventions and treaties will be promoted. The Policy also sets priority in data strengthening through survey of fisheries and aquatic resources, stock assessment and exploratory fishing.

In terms of livelihood enhancement, the policy calls for use of appropriate gear, protecting the rights of traditional fishers, diverting excess fishing effort in coastal waters to offshore waters and promotion of alternative livelihood avenues.

In international documents such as the United Nations Conventions on Law of the Sea (UNCLOS), the 1995 Code of Conduct for Responsible Fisheries of the Food and Agricultural Organization (FAO) and the United Nations Fish Stocks Agreement, it is now well established that right to fish comes with the responsibility of sustainable fishing. The measures suggested in these global initiatives include adaptation of suitable measures to conserve fisheries resources by a country through:

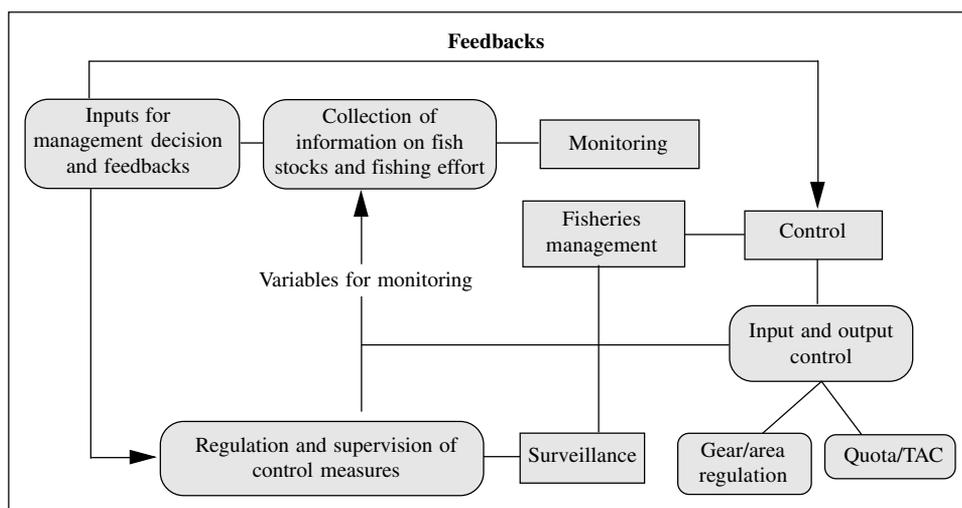
- *collection of up-to-date information on the status of fisheries resources and fishing effort and sharing the same;*
- *monitoring and controlling fishing fleet plying in its waters or flying its flag;*
- *setting up an enabling framework to match exploitation of resources with its rate of regeneration or optimized yield;*
- *prevention of pollution and destruction of fisheries habitats by any method; and*
- *building a transparent management system by involving stakeholders.*

The measures suggested in the international documents are the building blocks of an effective system of MCS for fisheries resources. It is distinctly different from the traditional monitoring, control and surveillance measures aimed at policing and revenue generation and which is generally considered as a failure to conserve fish stocks and manage fishing conflicts.

### 3.0 Understanding MCS: global practices and national situation

#### *The MCS system*

Although monitoring, control and surveillance are three separate concepts<sup>3</sup>, in fisheries management they are used in conjunction with each other. This is because the components or attributes of these concepts are closely interlinked and often overlapping (**Figure 1**).



**Figure 1: Relationship among MCS components and fisheries management**

The MCS system applicable to a particular country or the MCS system a country may consider for adoption primarily depends on the following:

- *the type of fisheries: coastal/offshore/single-species/multi species;*
- *the fisheries regime: open access/closed;*
- *fisheries capitalization: mostly mechanized/ large number of artisanal fishers;*
- *relation of fisheries to the economy: major driver/food and nutrition source/minor activity;*
- *level of economic development: resource deployment/human capital/technology;*
- *quality of governance: responsible/democracy/degree of corruption/legislation and judiciary; and*
- *international pressure: international treaties/organization/donors/conditional aid, etc.*

<sup>3</sup> The globally accepted definition of MCS as provided by FAO is as follows: *Monitoring – the continuous requirement for the measurement of fishing effort characteristics and resource yields; Control – the regulatory conditions under which the exploitation of the resource may be conducted and Surveillance – the degree and types of observations required to maintain compliance with the regulatory controls imposed on fishing activities. FAO, 1981. Report of an Expert Consultation on Monitoring, Control and Surveillance Systems for Fisheries Management. FAO Report FAO/GCP/INT/344/NOR.*

The MCS tools include data collection and stock monitoring; licensing of fishing vessels; basic to advance vessel monitoring system (VMS) using colour coding to radar and satellite tracking; on-shore and at sea patrolling; landing site monitoring; etc. These tools can be clubbed into land-based; sea-based and sky-based tools. However, in practice, the efficacy of the MCS system does not wholly depend on how sophisticated the system is, but rather on how well-coordinated the land-sea-sky based tools are.

Therefore, resource limitation is not a hindrance for building an effective MCS system. For example, satellite monitoring is the most extensive and costly system of monitoring. However, it is not complete in itself unless it is supported by at-sea identification methods. On the other hand, colour-coding and displaying of registration numbers, coupled with synchronized land-based monitoring and minimum aerial support can be quite effective as demonstrated by Malaysia<sup>4</sup>.

Therefore, the question is as to what should be the attributes of an effective MCS system in Sri Lanka? The following section analyses the country's economy and fisheries sector and draws a framework of the possible attributes of a sound MCS mechanism applicable to Sri Lanka.

#### ***Developing an MCS system based on national requirements***

**The Economy:** According to World Bank, Sri Lanka's economic growth remains uneven. On the whole the economy has been resilient to adverse shocks like the three-decade civil strife and the devastating tsunami of December 2004. However, the relatively strong growth record has proved inadequate to substantially reduce poverty beyond the urban areas in the country. Rapid growth in the services and industry sectors remains concentrated in urban areas, while stagnation in agriculture has adversely impacted the rural economy where most of the poor live.

During the period 2000-08, as **Figure 2** (*facing page*) shows, Sri Lanka has achieved a growth rate of average 5-6 percent, which is quite commendable given the political situation. However, at the same time, the rate of inflation often hovered around double digit possibly due to an average budget deficit of 7-8 percent of GDP and resorting to deficit financing and external borrowing. On the other hand, as **Figure 3** (*facing page*) shows, during 1990-2008 the Official Development Assistance (ODA) and official aid fluctuated considerably, although overall showing an increasing trend. At the same time (1990-2008), high inflation and external borrowing resulted in weakening of the Sri Lankan Rupees against US Dollar - from 40 LKR/ US\$ in 1990s to 112 LKR/ US\$ in recent times.

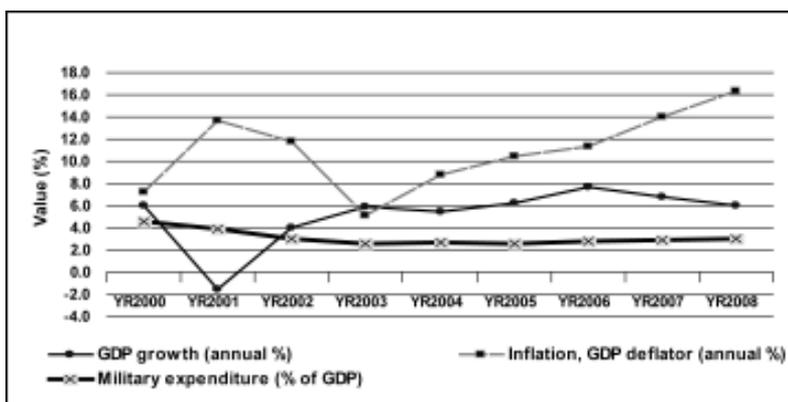
In terms of policy measures, the Government has promised to invest in infrastructure, develop offshore fisheries and provide subsidy to fishers. In the 2009 Budget, the Government has allocated LKR 7 655 million to develop fisheries sector, most of which is earmarked for infrastructure and post-tsunami rehabilitation<sup>5</sup>.

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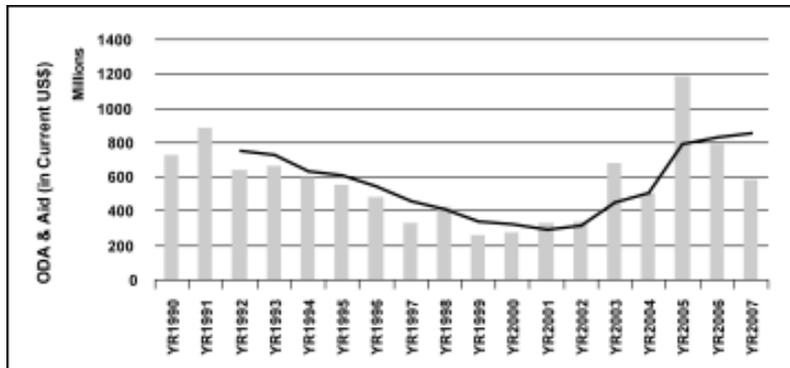
<sup>4</sup> *Fishing Vessel Identification and Marking (FAO and Malaysian systems) in Flewwelling, P, Cullinan, C, Balton, D, Sautter, R P, Reynolds, J E Recent trends in monitoring, control and surveillance systems for capture fisheries. FAO Fisheries Technical Paper. No. 415. Rome, FAO. 2002. 200p.*

<sup>5</sup> *The types of relief measures given include a state of the art fish marketing complex, Peliyagoda (Rs. 600 million), Dikowita Fishery Harbour (Rs. 2940 million), Post-Tsunami Rehabilitation and Recourse Management (Rs. 895 million), Rehabilitation of Tsunami Damaged areas (Rs. 340 million), etc and assistance to the coastal fisheries industry in the Eastern Province (Rs. 15 million).< <http://www.thefishsite.com/fishnews/10637/sri-lanka-to-develop-fisheries-sector>>*

**The lessons** drawn from the above analysis are that (i) MCS system in Sri Lanka can be developed through budgetary allocation as indicated in the policy documents; (ii) for long-term sustainability of the MCS system, the operational costs should be transferred gradually to the fisheries sector itself so that the budgetary allocation may be utilized towards infrastructure, research and development; and (iii) while pilot-scale MCS system may be implemented with donor support and/or aid, given its nature, the country-wide MCS system should be developed through domestic budgetary commitments.



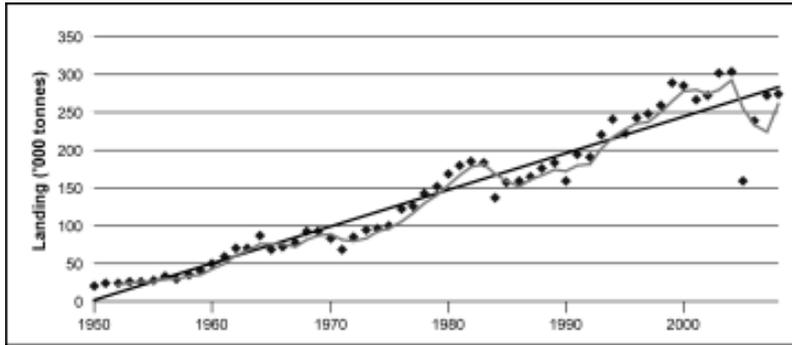
**Figure 2: Trends in important economic variables of Sri Lanka, 2000-08**



**Figure 3: ODA and aid received by Sri Lanka, 1990-2007**

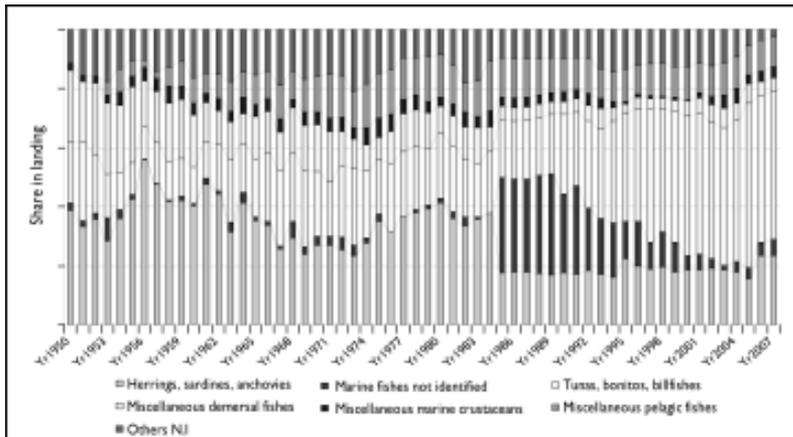
### The marine fisheries sector

The marine capture fish production in Sri Lanka has achieved a nearly steady growth during the period 1950-2008. The long-term analysis of the landing data shows that marine capture fisheries has increased from 20 622 tonnes in 1950 to 167 594 tonnes in 1980 and then to 274 630 tonnes in 2008 with a Cumulative Annual Growth Rate (CAGR) of 4.43 percent. However, time series analysis of the data shows the presence of strong positive correlation, that is if one value is above average, the subsequent values also tend to be above average. As can be seen from **Figure 4** (on page 48), the landing data perfectly matches a three-year moving average indicating strong seasonality.



**Figure 4: Long-term growth pattern of marine capture fisheries in Sri Lanka**

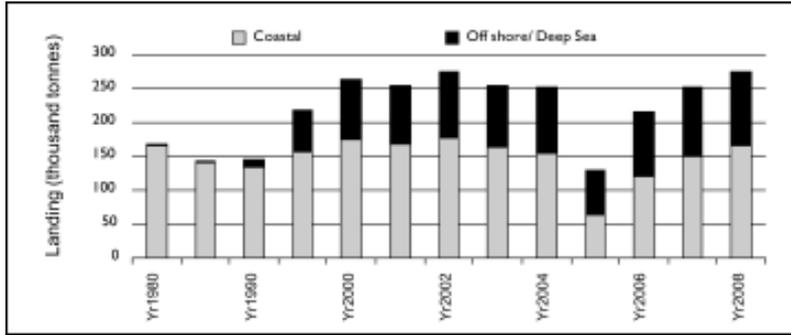
In terms of species composition, the landings have changed substantially overtime. Tuna and tuna like fishes which used to comprise 20 -30 percent of the total landings till 1990s, now comprise about 50 percent of the total landings. On the other hand, the share of herrings, sardines, anchovies has remained more or less stable at 20-30 percent. Excluding these two groups, the other major groups are miscellaneous pelagic species, marine crustaceans and demersal fishes (*Figure 5*)



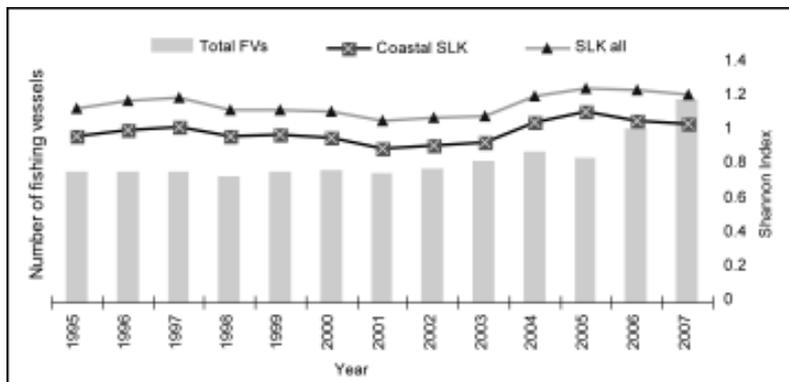
**Figure 5: Landing composition dynamics, 1950-2007**

The marine fisheries sector of Sri Lanka comprises two sub-sectors: coastal fishery and offshore/deep sea fishery. As of now, majority of the fishing activities are carried out in the coastal waters, which also provide the major share of the catch. However, increasing demand for offshore resources like tuna and continuous governmental efforts to promote offshore fisheries has resulted in rapid growth of this sector since the 90s (*Figure 6 - facing page*).

On the basis of some earlier studies, the MSY for coastal waters of Sri Lanka has been estimated at 250 000 tonnes. The current production level stands at 65-70 percent of the MSY in the coastal waters. However, such aggregate information may distort the ground realities to a large extent. Since, fishing effort is not evenly distributed throughout the coastal waters, it is more likely that resources are fully or over-exploited in many parts of the coast. As mentioned earlier, the 2007 Fisheries Statistics Handbook of Sri Lanka published by the National Aquatic Resources Research and Development Agency (NARA) reported a decline in labour productivity and productivity of capital in the coastal waters (*Figure 7 - facing page*).



**Figure 6: Growth and sectoral composition of marine fisheries in Sri Lanka**



**Figure 7: Trend in labour and capital productivity in marine fisheries in Sri Lanka, 2002-07**

While the capital productivity in offshore waters is much higher, it has also declined to a large extent during 2002-07. The highest capital productivity of 36.1 was reported in 2002 in off-shore/deep sea fishery, but thereafter it declined and has never reached the 2002 level. During the same period, an additional fleet of 800 vessels were also added to the offshore fisheries.



**The lesson**, since not much information is available on the state of resources, the declining productivity can serve as an index of the state of resources. As mentioned earlier, the trend shows a decline and possibly indicates worsening status of the resources. Although, the productivity did improve in 2007 over 2006, this might be due to seasonal variations unless further evidences can be gathered to show improvement in the state of resources.



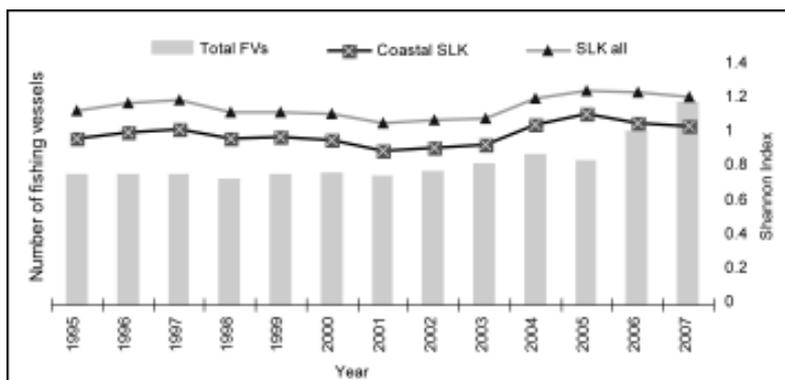
The offshore fishery is capital intensive and, therefore, needs larger threshold level of catch compared to the coastal fishing vessels to cover operational costs. At this point, no conclusive information is available either on the magnitude of the MSY in offshore waters<sup>6</sup> or minimum level of catch required by offshore fishing vessels to remain profitable. Further, expansion of fisheries to offshore waters should consider these two factors. Similarly, in coastal waters too, assured availability of catch is important. When catch per unit effort (CPUE) declines, it directly affects the well-being of fishers. The most cost-effective solution adopted by the fishers to counter the situation (in the short run) is to resort to more efficient fishing gear, or if the situation warrants, to destructive and illegal fishing gear. Voluntary withdrawal of fishing effort is hardly possible in the short run as fishers do not have viable and attainable alternatives. Hence, in an ideal situation effort should be limited through fleet optimization, conditional licensing like setting quotas and maintaining fishing roster.

In terms of the evolutionary path of fishing craft development in Sri Lanka, the three important milestones are the motorization of traditional fishing crafts (1960s), introduction of multi-day offshore fishing vessels (1970s with success in 1980s) and introduction of outboard motorized FRP boats (mid-1980s). December 2004 was another watershed in the history of Sri Lankan fishery when majority of the fishing vessels were washed away or damaged by the devastating tsunami. However, owing to a large number of donor-supported projects, the number of boats during the post-tsunami period exceeded that of the pre-tsunami period. In quantitative terms, the number of boats per 100 active fishers was about 21 before tsunami, which declined to 18 immediately after tsunami but increased to 25 by 2006 and to 27 by 2007.

From the standpoint of building an effective MCS system not only the volume of fishing effort but also the diversity or heterogeneity of fishing effort plays a decisive role. In this respect, the marine fisheries sector in Sri Lanka depicts a kaleidoscopic picture. The coastal waters host a multi-species, multi-gear fishery and the offshore waters host selective species and selective gear (often single) fisheries. In **Figure 8** (facing page) the increasing number of fishing craft is captured in the rising columns and fleet diversity is summarized in the Shannon Index. The fishing effort is not only increasing in number, but also in diversity.

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<sup>6</sup> Some estimates based on commercial fishery survey placed the potential yield from offshore waters between 29 000 to 40 000 tonnes. The current level of exploitation is about 100 000 tonnes. (Source: Dayaratne P (1990): *Offshore Fishery Resources in Sri Lanka*. Paper presented in the Seminar on Offshore Fishery in Sri Lanka, 21-22 February, 1990, Negombo). However, the Department of Fisheries and Aquatic Resources website puts it at 150 000 tonnes <[http://www.fisheriesdept.gov.lk/english/statistics\\_english.html](http://www.fisheriesdept.gov.lk/english/statistics_english.html)>.



**Figure 8: Changing number and composition of fishing crafts in Sri Lanka; 1995-2007**

Since, newer crafts are being introduced while traditional crafts are still in vogue; the fleet diversity shows an increasing trend.

As per the census of fishing boats conducted by the MFARD during 2006 and 2007, all fishing boats were registered under the categories of (i) Inboard Multi-day (IMUL); (ii) Inboard Single-day (IDAY); (iii) Out-board Engine Fiberglass Reinforced Plastic Boats (OFRP); (iv) Motorized Traditional Crafts (MTRB); (v) Non-motorized Traditional Crafts (NTRB); and (vi) Beach Seine Crafts (NBSB). Each category represents one unique production system and has its own set of relations. It is also seen that while the coastal waters host five different types of production systems, each of which has its own set of stakeholders, the offshore waters are fished by only one category of boat *i.e.* the IMUL.

**The lessons**, increasing diversity implies increasing complexity. The growing and changing fishing fleet of Sri Lanka possess both complexity and implementation vacuum for an effective MCS. Apart from the fleet structure, the geographical diversity of Sri Lanka is also adding to the complexity of the MCS system. As can be seen from **Table 1**, the marine fishery is carried out in 15 coastal districts. There is considerable variation in fishing intensity among the districts. The northern districts at this point of time are lagging behind owing to the long years of civil strife. However, with the end of the civil strife, they are expected to not only resume fishing but in the years to come also intensify production. Also, there are 1071 landing points spread in these 15 districts. About 97 percent (1 053) of the landing points are traditional landing centres or *Thotupala*. In 2006, only 2 883 crafts out of the

**Table 1: Pattern of fishing intensity in the coastal districts**

Fishing craft	Fish production		
	High	Medium	Low
High	Negombo	Puttalam, Chilaw	Batticaloa, Trincomalee, Jaffna
Medium	Matara	Tangalle	Kalmunai
Low	Kalutara	Galle	Colombo, Mullaitivu, Kilinochchi, Mannar

Source: Calculated from Fisheries Statistic Handbook, 2007.

35 350 operating fishing fleet operated from the main fishery harbours in the country, of which 2 220 were IMULs.

**The lessons,** the fishing operations are now concentrated in the southern and western provinces. However, the eastern province has a large fleet strength, which is now expected to become fully operational. The fishing operation is carried out from hundreds of small fish landing centres (92%) and mostly the IMULs operate from the fishery harbours. Further, given the size of the fishing fleet there is not enough fisheries infrastructure to cater to all of them. The Presidential commitment to build “100 fishery harbours, anchorages, boat yards and fishery crafts centers along the coastline” is expected to improve the situation. However, in the present scenario, building credible land-based monitoring and surveillance system is a daunting task.

The marine fisheries census carried out in the past during 1995-96 to 1996-97 and again during 2006-07 provides valuable information on fisheries dynamics in Sri Lanka. However, the information is not complete since the census could not be carried out in the Northern Province. The statistics also show that during the decadal gap there has been substantial increase in both the number of active fishers and fishing vessels at the district level (**Table 2**). In Matara and Colombo, there is relatively higher increase in number of fishing vessels than increase in number of active fishers, indicating rapid capitalization of fisheries in these areas. In Puttalam and Chilaw, the magnitude of increment in number of active fishers and number of fishing boats is nearly equal. However, in the districts of Eastern Province, there is more rapid rise in number of active fishers as compared to fishing vessels.

Overall, there is sharp increase in the number of active fishers compared to number of fishing vessels. During the same period, 1997-2007, the fisher population has increased from 344 497 in 1997 to 664 820 in 2007 or nearly doubled. This is quite higher than the growth of total population of about one percent per year during the same period. Although

**Table 2: Change in number of active fishers and fishing vessels during 1997-2007**

District	Total boats (2007)	Total boats (1997)	Change over 1997 (%)	Active fishermen (2007)	Active fishermen (1997)	Change over 1997 (%)
Puttalam	4 638	3 680	126	13 700	9795	140
Chilaw	3 868	3561	109	9 310	8039	116
Negombo	4 433	3 930	113	13 460	10 146	133
Colombo	844	508	166	1 670	2 235	75
Kalutara	1 374	1 022	134	4 610	4 150	111
Galle	2 024	1395	145	5 760	5 134	112
Matara	2 664	889	300	7 980	5 120	156
Tangalle	2 391	1635	146	6 260	4 843	129
Kalmunai	2 414	1576	153	19 040	13 224	144
Batticaloa	4 372	4987	88	22 210	13 533	164
Trincomalee	3 713	2269	164	21 170	7557	280
<b>Total</b>	<b>32 735</b>	<b>25 452</b>	<b>129</b>	<b>1 25 170</b>	<b>83 776</b>	<b>149</b>

Compiled from the 1997 and 2007 Census of Marine Fisheries in Sri Lanka. Department of Fisheries and Aquatic Resources.

it cannot be concluded how these growth patterns will affect the fisheries sector in the coming days, it is quite certain that pressure on fisheries resources is increasing rapidly. In addition, comparing the increase in fisher population and increase in number of active fishers, it may be assumed that there is little out-migration from fisheries sector to other sectors at present and which coupled with rapid population growth may further intensify the pressure on fisheries resources in Sri Lanka.



#### ***Summing up the lessons so far.....***

1. An effective MCS system in Sri Lanka is a basic necessity in view of the declining returns from fisheries, which in the absence of a strong and reliable biological database can be considered as an indicator of the state of fisheries resources;
2. Declining return from fisheries will negatively affect the wellbeing of fishers and ultimately the food and nutritional security of the country. Hence it is of utmost importance to develop an effective management system that ensures profitability of the operation as well as sustainability of the resources;
3. A sound MCS system can be developed based on domestic budgetary allocations. At present the budgetary allocations for MCS are inadequate. However, given the existing directives in fisheries policy and political commitments, this situation can be changed;
4. Further, to make the MCS system sustainable, the cost should be gradually transferred to the beneficiaries;
5. There is no 'thumb rule' or a single MCS solution for marine fisheries in Sri Lanka. While coastal fisheries will need closer and intensive monitoring, offshore fisheries will require an extensive monitoring and surveillance system;
6. Additionally, the large geo-spread of marine fishing operations increases the complexity of the MCS system. Ongoing infrastructural development programmes will address this problem to an extent but not completely. It is a serious policy challenge on how to effectively implement MCS in all the fish landing centres. Setting up of MCS on selective basis to only cover important fishing areas and landing points in the long-run may be self defeating, as an uneven MCS regime will provide incentives to IUU fishing in the weakly monitored areas.

#### **4.0 Implementation of MCS in Sri Lanka**

The management gaps that need to be addressed by an MCS system in Sri Lanka can be identified as follows:

- *Information gaps on status of fisheries resources, especially the commercially important fish stocks;*

- *Increasing fishing effort;*
- *Use of prohibited fishing gear;*
- *Rush to offshore fisheries without any information on the status of resources;*
- *Absence of traceability for fish catch outside the export sector;*
- *Curbing the extent of IUU fishing in Sri Lankan waters;*
- *Lack of understanding among stakeholder on the need of MCS system; and*
- *Ensuring the interests of the small-scale fishers.*

In the given situation, some of the main instruments that could be used in implementing MCS in Sri Lanka are:

- determining the level of sustainable exploitation and other relevant information by data gathering, assessment and analysis;
- controlling (optimizing) fishing effort (*e.g.* through licensing, quota and rostering), especially in coastal waters;
- selecting appropriate management instruments to balance interest of fishers and other sectors;
- developing fisheries management plans based on precautionary principles;
- enforcing controls in ports and at sea;
- adopting VMS, especially for the IMUL category of fishing vessels;
- educating the community through information dissemination;
- promoting co-management strategies and devolving rights to communities; and
- providing legislative support for fishery management plans and regulations to ensure equitable allocation of resources.

Another critical requirement for effective MCS is the establishment of a coordinating mechanism, with well-defined objectives and a clear work plan. The Government cannot practice MCS in isolation and, therefore, coordination among stakeholders is essential. In this regard, an important approach to MCS is to foster a strong local awareness on the need for conservation and management. The setting up of MCS can also assist in establishment of multiple channels of communication, which can provide information to the fisher community on weather, commodity and market prices, safety at sea aspects, hygiene, etc.

In terms of involving the stakeholders, under the Fisheries and Aquatic Resources Act, 1996 and its amendment in 2004, there are provisions for setting up Fisheries Management Areas involving the community. However, even prior to independence, Sri Lanka had the tradition of involving the community in fisheries management as can be seen from the Village Communities Ordinance No 24 of 1889. However, on the other hand, Sri Lanka is the only country in the region that has not established a zonation system for different categories of fishing vessels. Lack of zonation may undermine both sustainability of the resources and safety at sea of fishers.

## 5.0 The Action Plan

In January 2008, the four member-countries of the Bay of Bengal Programme Inter-Governmental Organisation (Sri Lanka, Maldives, India, and Bangladesh) along with experts met in Chittagong, Bangladesh to discuss implementation of MCS within their national jurisdictions as also on a regional basis. At the end of the three-day Workshop, the member-countries agreed on a common agenda, which is known as '*Chittagong Resolution*' (see Annexure). The Resolution *inter alia* recommends that 'member-countries undertake measures to formulate time-bound action plans for successful implementation of MCS and for strengthening the national agencies responsible for MCS'. In view of the '*Chittagong Resolution*', one of the objectives of this National Workshop is also to formulate an 'action plan', which can guide the development of MCS in Sri Lanka.

The main objective of implementing MCS in Sri Lanka should be to secure responsible and sustainable management of fisheries resources while allowing an ecologically safe and economically profitable exploitation of living marine resources in the interest of not only today's population but also for posterity. Post UNCLOS<sup>7</sup>, 'freedom of the sea' has changed to 'sovereign control of the EEZ'. However, this control comes with an added responsibility of responsible utilization of the resources. In such a scenario, the objective should aim at bringing in a paradigm shift in the marine fisheries sector from open access to limited and controlled access and wherever possible allocating rights to the user groups.

While it is recognized that there are no unique solutions to the design and implementation of MCS system, the action plan should be based on common principles and goals, with the end objective of meeting the specific requirements of the Fisheries Policy of the Government of Sri Lanka and local culture and customs. In this regard, the proposed framework of the action plan is suggested as follows:

- *Review of existing marine fisheries management programmes and analysis of fisheries in the territorial waters and the EEZ (this will inter alia include census of fishing vessels and their registration, enumeration of the number and category of gear, fishing harbours/fish landing sites, boat building yards, etc);*
- *Review of the existing fishing vessel licensing and registration procedures and practices, fisheries legislations and the relevant legislations/ordinances of the other Ministries/ Departments (e.g. Ministry of Environment) that have bearing on fisheries sector;*
- *Assessment of the MCS capacity and identification of institutional development requirements within the M/DFAR, and, if necessary, other concerned sister Departments;*
- *Strengthening of MCS Unit in the MFARD;*
- *Preparation of an outline of procedures and practical application of fisheries MCS programme and its implementation on pilot basis (in one or two manageable sites);*
- *Organisation of community groups at the selected sites and their orientation for participation in the MCS;*
- *Training of core MFARD/Navy staff in MCS;*
- *Organisation of hands-on workshops for stakeholders; and*
- *Development of manual/guidelines essential for implementation of MCS.*

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<sup>7</sup> Sri Lanka has ratified the UNCLOS in 1994.

## 6.0 Conclusion

The fisheries sector is critical to the economy of Sri Lanka. On one hand it is an important contributor to the food and nutritional basket of the country, on the other hand it is one of most important source of livelihoods for the coastal communities. Therefore, the ultimate objective of a MCS system in Sri Lanka is to not only protect the resources but to stabilize the sector, minimize occupational hazards and optimize policy benefits. In this regard, the state as a custodian of the resource should not hesitate to effectively implement the Doctrine of Public Trust and the Precautionary Principle. A sound MCS system can be a win-win situation for both the government and the fishers as the community can find multiple benefits such as (i) effective demarcation of fishing areas; (ii) better insurance deals from data strengthening; (iii) target fishing through resource mapping; (iv) sea-safety; (v) reflecting their stakes in fishing policy; (vi) stabilization of catch per boat, hence income; and (vii) possible jobs in land and sea-based monitoring systems and at the same time the government will be able to exploit the resources in a sustainable manner. While attempting to do so, the government may also bear in mind that a participatory approach with the fullest involvement of the community and other concerned stakeholders would bring the best results. It may also be useful to promote MCS as a business-strengthening package, which would be more appealing and effective in community mobilization.

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### *The Chittagong Resolution*

**Conscious** that the marine fisheries sector is highly important for the economies of member-countries of the Bay of Bengal Programme Inter-Governmental Organisation (BOBP-IGO);

**Recognizing** that the marine fisheries sector is a major contributor to the livelihoods, food and nutritional security and foreign exchange earnings of member-countries;

**Realizing** that a high percentage of the world's artisanal fisheries and small-scale fisheries are concentrated in South Asia, where many of the coastal stocks are almost fully exploited;

**Recognizing** that the marine fisheries sector largely operates in an open-access regime, and that the present condition of fisheries is largely attributable to weaknesses in the institutional and regulatory environment, a declining resource base and poor socio-economic conditions;

**Realizing** that monitoring, control and surveillance (MCS) regimes are weak in the marine fisheries sector of member-countries;

**Concerned** about the social and political constraints in regulating access to marine fisheries and in optimizing the fishing fleet;

**Concerned** that the current fisheries management regime for coastal fisheries in the region may lead to further unsustainable levels of exploitation of fisheries resources, and thereby impact the livelihoods of small-scale fishermen;

**Concerned** that the supporting regulations and policy framework relevant to the needs of MCS for small-scale fisheries, remain inadequately addressed by fisheries and maritime administrations in the sector;

**Recognizing** the limitations in institutional capacity of fisheries and maritime administrations in the region to undertake all responsibilities associated with the mandate;

**Recognizing** that the 1995 Code of Conduct for Responsible Fisheries (CCRF) of the FAO does not adequately address the need and requirements of MCS in marine fisheries;

**Emphasizing** the urgent need to address the multi-dimensional issue of MCS for small-scale fishermen in a holistic manner; and

**Recognizing** that the problem is not insurmountable;

We, the representatives of Fisheries and Maritime Administrations, Coast Guard and Fishermen's Associations, nominated by the Governments of Bangladesh, India, the Maldives and Sri Lanka, having participated in the BOBP -IGO Regional Workshop on Monitoring, Control and Surveillance for Small-scale Fisheries held in Chittagong, People's Republic of Bangladesh, from 16 -18 January 2008, now therefore:

**Resolve** to address, as a matter of urgency, the issue of MCS for small-scale fisheries;

**Recommend** that MCS requirements be comprehensively integrated into every member-country's fisheries policy and regulatory and managerial frameworks. This would include associated commitments under the CCRF and other regional, inter-regional or global instruments and initiatives;

***Emphasize*** the need to rationalize institutional mandates and inter-sectoral cooperation at the national level, in order to enhance implementation of MCS in small-scale fisheries;

***Recommend*** that fisheries and maritime administrations enhance their knowledge and database on the health of the fish stocks and on commensurate efforts required to harvest resources in a sustainable manner;

***Recommend*** the development and implementation of education, training and awareness programmes which satisfy and promote MCS requirements;

***Recommend*** that mandatory requirements for improving implementation of MCS be supplemented by other strategies which involve the participation of fisher communities, families, the media and other stakeholders in order to promote the adoption of a wide range of MCS measures;

***Recommend*** that member-countries, while implementing MCS, also undertake measures to enhance the economic viability of small-scale fishing enterprises, as an essential element of the marine fisheries sector;

***Recommend*** that member-countries make full use of the available technologies, including Vessel Monitoring System wherever feasible, in support of MCS;

***Recommend*** that member-countries employ innovative measures such as co-management. This will be an effective cost-sharing measure for MCS and enhance the participation of fishers and other stakeholders in the management of marine fisheries resources;

***Recommend*** that member-countries undertake measures to formulate time-bound action plans for successful implementation of MCS and for strengthening the national agencies responsible for MCS;

***Recommend*** that member-countries undertake measures directed towards regional cooperation in ensuring successful implementation of MCS; and

***Strongly recommend*** the formation and implementation of a regional MCS programme, employing a consultative and participatory approach, building upon institutionally derived data and the operational experience of small-scale fishermen.

***Adopted on Friday, 18<sup>th</sup> January 2008 in Chittagong, Bangladesh.***

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## **The State of Marine Fisheries Resources and Fisheries Livelihood in Sri Lanka<sup>1</sup>**

### **1.0 Introduction**

The fisheries sector plays a significant role in sustaining food security and providing employment and has also emerged as a dynamic export oriented sector providing considerable foreign exchange to the Sri Lankan economy. The sector contributes about 60 percent of the animal protein supply of the country and the annual per capita availability of fish and fishery products is estimated at 14.6 kg. The fisheries sector contributes about 1.5 percent of the GDP and currently provides direct and indirect employment to about 4 00 000 people comprising 1 70 000 in fishing, 1 00 000 in associated activities and 1 30 000 in fish trade. There are a large number of production and service oriented private and public sector organizations to facilitate fishing, fish marketing, distribution and international trade. Among them boat construction, net manufacturing, ice production and fish processing industries play a vital role as link industries. Thus the fisheries sector and allied services provide sustenance to at least 2.4 million people in the country.

Sri Lanka has a coastline of around 1 700 km and the coastal zone has a considerable socio-economic importance. The coastal zone contains 25 percent of the land area of the country, 25 percent of the population, 70 percent of the hotels and 70 percent of the industrial units. There are three main sub-sectors within the fisheries sector *viz.*, coastal fisheries; offshore/deep sea fisheries; and inland fisheries and aquaculture.

### **2.0 The marine resource base**

Fisheries and aquatic resource (*Table 1 below & Figure 1 on page 62*) of Sri Lanka includes a territorial sea of 21 500 sq. km and an Exclusive Economic Zone (EEZ) of 5 17 000 sq. km. The country has a narrow continental shelf with an average width of 22 km. Its extent is 30 000 sq. km or 5.8 percent of the oceanic area of Sri Lanka. Though Sri Lankan waters are rich in species diversity, the narrow continental shelf and the non-occurrence of upwelling impose limitations on fisheries productivity of the country.

Sri Lanka's long coast line contains a variety of coastal habitats that include estuaries and lagoons, mangroves, coral reefs and large extents of beaches and dunes that are vital to ecological functioning and maintenance of bio-diversity.

**Table 1: Marine zones and maritime fisheries resources**

Exclusive Economic Zone (200 nm)	517 000 sq.km
Length of shore line	1 817.5 sq.km
Historic waters	21 500 sq. km
Continental shelf	30 000 sq.km
Extra seabed	1 000 000 sq.km

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<sup>1</sup> *Dr (Ms) H P K Hewapathirana, Biologist, Department of Fisheries & Aquatic Resources, Government of Sri Lanka.*

### 3.0 Method of data collection

The Statistical Unit of the Ministry of Fisheries and Aquatic Resources Development (MFARD) obtains data based on scientific sampling methods from all the institutions under the purview of the Ministry. The Statistical Unit also receives fish landing data collected by the Fisheries Inspectors from all the Districts. The data collected by the National Aquatic Resources Research and Development Agency (NARA) on offshore fisheries is also used for preparing statistics on offshore large pelagic fisheries. On certain occasions, special census has also been conducted for fishing boats and fishing households under foreign funded projects. The data on export of fish and fish products is generally sourced from the records of the Customs Department.

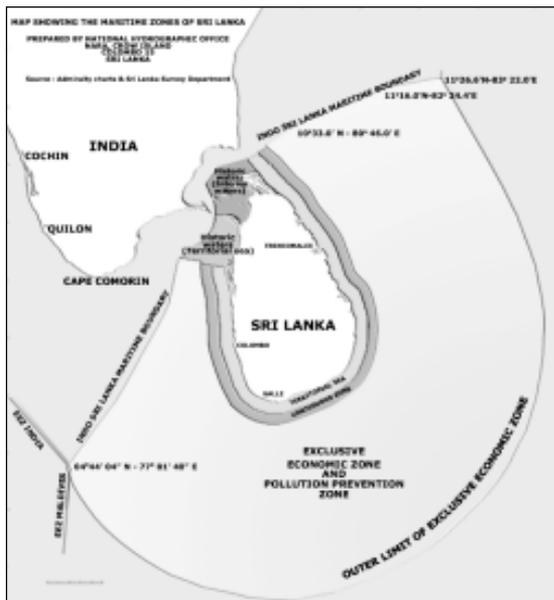


Figure 1: Marine zones of Sri Lanka

### 4.0 The marine fisheries sector of Sri Lanka

The marine fishery sector of Sri Lanka constitutes coastal fisheries and offshore/deep sea fisheries. Post 2004 Asian tsunami, the fisheries sector recorded the highest production of 3 19 120 tonnes in 2008, after the previous peak recorded in 2002.

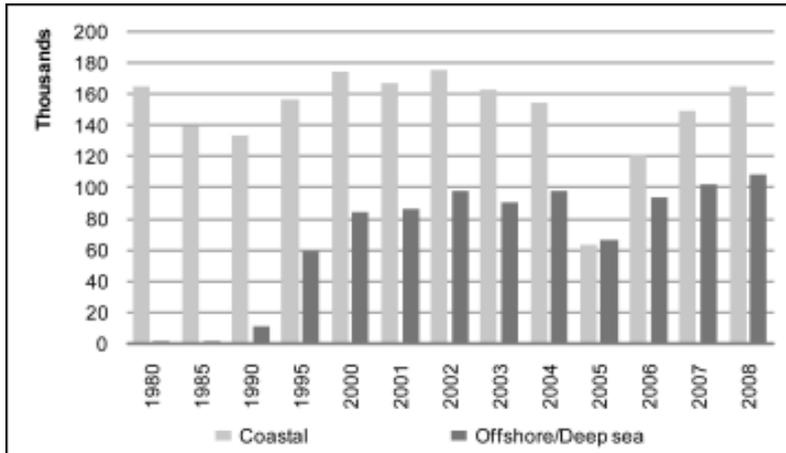
#### 4.1 Coastal fisheries

Fishing crafts operating on single-day basis within the continental shelf belongs to this sub-sector. Coastal fisheries continue to be the dominant sub-sector in terms of its contribution to overall production and employment. Coastal fisheries account for about 40 060 fishing crafts representing 93 percent of the entire fishing fleet of the country and contribute to about 52 percent of the total production. An estimated 80 000 fishers are directly involved in coastal fisheries of Sri Lanka.

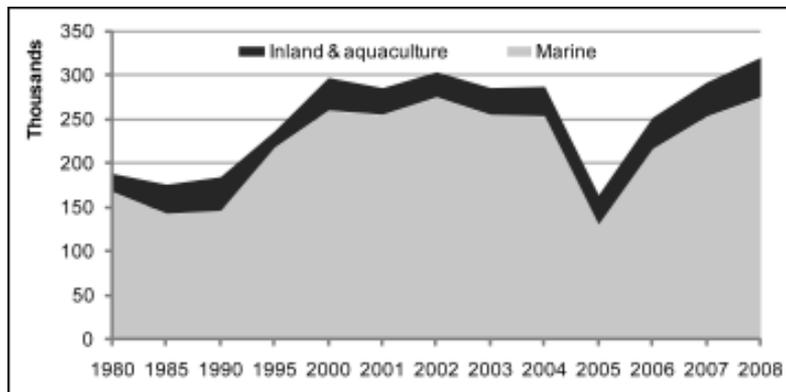
According to the R V Dr Fridtjof Nansen Survey conducted during 1979-80, the total maximum annual sustainable harvestable yield from the coastal area was estimated at 2 50 000 tonnes, comprising 1 70 000 tonnes pelagic fish and 80 000 tonnes of demersal species. The highest production ever achieved in the coastal sub-sector was 1 84 049 tonnes in 1983 (**Figures 2 & 3 - on facing page**) The strategies that can be considered for increasing coastal fish production are (i) promoting the harvesting of unexploited and underexploited species by diversifying gear; and (ii) improving the productivity of the existing vessels.

#### 4.2 Offshore/deep sea fisheries

Fisheries taking place outside the continental shelf and extending up to the edge of the EEZ and even in the high seas by the multi-day boats belong to this sub-sector. The last comprehensive survey for this sub-sector was also done in 1979-80 (by RV Dr Fridtjof Nansen), which indicated the harvestable yield to range between 90 000 to 1 50 000 tonnes.



**Figure 2: Coastal and offshore fisheries production in Sri Lanka, 1980-2008**



**Figure 3: Growth composition of total fish production in Sri Lanka, 1980-2008**

Presently, the offshore/deep sea fishery is the rapid expanding sub-sector of the fisheries sector in the country. In the year 2007, offshore fish production was estimated at 1 02 560 tonnes and contributed 35 percent to the total fish production of the country (*Figure 2*). A total of 2 618 multiday fishing boats operated during the said year.

Sri Lanka has not been able to make effective use of the high value deep sea dwelling tuna, lobsters and other fish stocks due to non-availability of vessels with the requisite capabilities. Hence, the Government has planned to introduce new class of bigger size boats complete with line haulers, refrigeration equipment/storages, safety/navigation and communication equipment and accommodation and facilities for crews in line with international regulations. The Government has a preference for promoting longline fisheries over gill netting to avoid entangling of small size fish and non-target species as well as to harvest good quality fish.

It is obvious from the above figures that coastal fishery has reached its maximum level of production. Offshore/deep sea fishery and culture-based fisheries are the alternative means to increase fish production in Sri Lanka.

### 4.3 Trends in labour and capital productivity

Along with the increase in fish production, the number of active fishers has also increased in Sri Lanka. Therefore, the yield per fisher has almost remained same as in the previous years. It also indicates that increase in fish production has not effectively increased the income of fishers in the country. Therefore, an appropriate step would be to assess the excess effort/fishers in the sector and direct them to alternative fishing and or allied/non-fishing activities in a time-bound manner (*Table 2*).

**Table 2: Labour productivity in marine fisheries**

Year	No. of active/ full-time fishermen	Marine fish production	Yield per fisherman
1989	63 635	144 266	2.3
1996	83 776	206 300	2.5
2002	114 206	274 760	2.4
2003	148 830	254 680	1.7
2004	151 800	253 190	1.7
2005	160 300	130 400	0.8
2006	143 150	215 980	1.5
2007	158 650	252 670	1.6
2008	171 470	274 630	1.6

Source: Sri Lanka Fisheries Year Book NARA 2008-Socio-economic and Marketing Research Division, NARA - Statistics Unit, Ministry of Fisheries & Aquatic Resources Development.

In 2008, the capital productivity was 4.5 tonnes and 23.2 tonnes per craft per year for coastal and offshore fisheries respectively. The ten year time-series data shows that capital productivity of both sub-sectors is declining. The current level of exploitation of coastal fishery resources, in particular small pelagic, is not sustainable. The fishing effort on coastal resources has increased significantly due to the entry of a large number of fishing crafts after the December 2004 tsunami. Sri Lanka has now taken steps to restrict the number of fishing crafts in the coastal waters and new registrations are not allowed (*Table 3*).

### 5.0 Export performance of fisheries sector by major product categories

The exported fish and fishery products comprise both edible and non-edible products. Chank shells and ornamental

**Table 3: Capital productivity in marine fisheries**

Year	Coastal fishery	Offshore/deep sea fishery	Total average
1998	7.0	25.5	9.0
1999	6.9	26.4	8.9
2000	7.1	29.1	9.4
2001	6.8	34.1	9.4
2002	6.9	36.1	9.8
2003	6.1	30.1	8.6
2004	5.6	32.1	8.3
2005	2.4	26.8	4.4
2006	3.8	28.7	6.1
2007	4.5	29.1	6.8
2008	4.5	23.2	6.6

Source: Sri Lanka Fisheries Year Book NARA 2008-Socio-economic and Marketing Research Division, NARA - Statistics Unit, Ministry of Fisheries & Aquatic Resources Development.

fish are non-edible products. The general trend of exports of fish and fishery products show an increase in all years, except 2005 and 2008, which resulted from a slump in shrimp exports (*Tables 4 & 5*). Since 1995, fish exports increased rapidly due to increase in tuna exports, which contributed 72.9 percent to the total exports in 2008 (*Table 6 - on page 66*). However, the fish and fishery products exports decreased by 3.87 percent in 2008 compared to that of 2007. Although mollusks, lobsters and crab exports increased, prawns, *beche-de-mer*, shark fin and fish showed decreasing trend during 2007-08. The drop in the value of exported prawns was off-set by the value increase in fish exports. Fresh fish was the main contributor to the export earnings and its share was 14 701 million Rupees or 77.06 percent of the total export earnings in the year 2008. Fisheries export values have generally contributed more than two percent to the total value of exports in recent years.

**Table 4: Export of fish and fishery products in quantity (tonnes)**

Export item	1983	1990	1995	2000	2005	2006	2007	2008
Prawns	1 720	1 855	2 781	4 855	1 800	1 837	2 023	854
Lobsters	207	165	283	164	183	168	184	249
Crabs	Na	Na	898	554	1 012	568	1 151	1 283
<i>Beche-de-mer</i>	56	36	248	87	258	153	208	180
Ornamental fish	Na	Na	Na	Na	Na	Na	Na	Na
Chank shells	144	Na	746	698	546	451	564	493
Shark fins	57	51	127	119	74	75	67	51
Mollusks	Na	1	51	15	300	106	713	1 460
Fish maws	Na	Na	1	1	1	1	1	1
Fish	209	821	1 978	11 873	10 960	14 301	15 473	15 014
Others	-	-	12	188	851	987	1 039	1 008
Exported quantity	<b>2 393</b>	<b>2 931</b>	<b>7 126</b>	<b>18 554</b>	<b>15 985</b>	<b>18 647</b>	<b>21 422</b>	<b>20 594</b>

Source: Customs Returns & Statistics Unit, Ministry of Fisheries and Aquatic Resources Development.

**Table 5: Export of fish and fishery products in value (Million Rs)**

Export item	1983	1990	1995	2000	2005	2006	2007	2008
Prawns	296	486	2 153	5 041	1 769	1 987	2 487	1 052
Lobster	38	50	260	157	267	307	352	405
Crabs	Na	Na	181	154	363	238	575	687
<i>Beche-de-mer</i>	15	27	148	143	334	144	445	317
Ornamental fish	28	68	273	593	756	888	906	973
Chank shells	03	Na	41	90	124	125	145	192
Shark fins	19	35	163	305	165	140	127	110
Mollusks	Na	13	16	14	98	55	228	287
Fish maws	Na	Na	2	1	1	1	1	2
Fish	17	175	413	3,782	6 335	10 037	13 560	14 701
Others	-	-	4	47	484	518	297	319
Export value	<b>417</b>	<b>854</b>	<b>3 655</b>	<b>10 328</b>	<b>10 696</b>	<b>14 440</b>	<b>19 1213</b>	<b>19 077</b>

Source: Customs Returns & Statistics Unit, Ministry of Fisheries and Aquatic Resources

**Table 6: Exported quantity and value for selected edible species**

Year	Tuna fresh/chilled		Tuna frozen		Other food fish		Shrimps & prawns /frozen	
	MT	Rs. Mn	MT	Rs. Mn	MT	Rs.Mn	MT	Rs.Mn
2004	543	331	1 820	973	5 652	3 172	2 380	2 298
2006	1 326	614	2 564	2 175	10 411	7 248	1 836	1 985
2007	2 739	1 254	4 343	4 736	8 391	7 570	1 657	2 049
2008	2 899	1 681	3 248	4 047	8 867	8 974	801	1 046

Source: Statistics Unit, Ministry of Fisheries and Aquatic Resources

## 6.0 Marine fish species of Sri Lanka

The following **Table 7** and **Figure 4** (on facing page) depict the major fish species/groups caught from Sri Lankan waters and landings of large pelagic fishery.

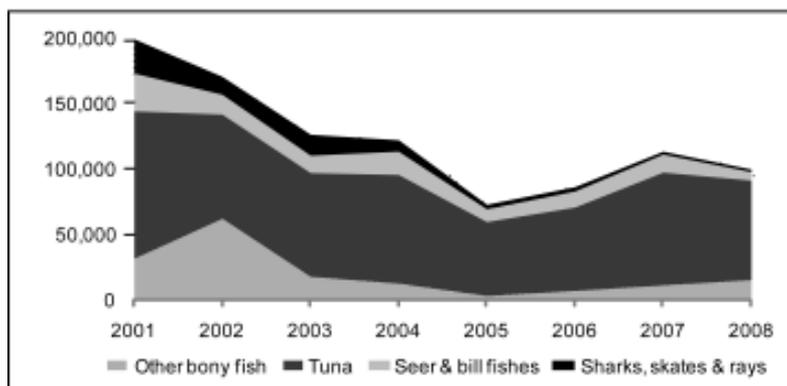
Fish landings of large pelagic fishery are based on estimates of continuous sampling programme launched by the Marine Biological Resources Division (MBRD) of NARA. The estimates include coastal as well as offshore/deep sea large pelagic fishes. The landings show that there is a rise in large pelagic production in the year 2007 and a remarkable drop in the following year 2008. If the time-series data is seen, the other bony fish production has increased by 35 percent and there is a drop in tuna and billfish production, which has led to the drop in the production of large pelagic fishes.

**Table 7: Major marine fish species/groups of Sri Lanka**

Commercial group	English name
Seer	Spanish mackerel.
Paraw	Jacks, travelies.
Balaya	Skipjack tuna.
Kelaawalla	Yellow fin tuna.
Kenda	Big eye tuna.
Other blood fish	Sail fish, Bullet tuna, Frigate tuna, kawakawa.
Sharks	Mackerel shark, Thresher shark, silky shark, whitetip shark, blue shark, hammerhead shark.
Skates and rays	Shovel nose rays, sting rays, spotted eagle rays, Japanes cownose rays, numb fishes, manta and devil rays.
Rock fish	Numb fish, manta and devil rays, spangled emperor, long face emperor, sharptooth jobfish, blubberlip snapper, mangrove red snapper, Malabar grouper, wavylined grouper, coral hind, Sri Lanka sweetlips, threadfin breams, parrot fish, rabbit fish, barracuda, mullets.
Beach seine varieties	Spotted sardinella, smoothbelly sardinells, rainbow sardine, white sardine, shad, goldstripe sardinella, white sardinella, anchovy, thryssa, silverbiddies, pony fish, ilishas, halfbeaks, flying fish.
Prawns	Giant river prawn, Indian white shrimp, giant tiger prawn, green tiger prawn.
Lobsters	Scalloped spiny lobster, ornate spiny lobster, prong horn spiny lobster, painted spiny lobster, slipper lobsters.
Others	Squids, cuttle fish, octopus, sea cucumber, crabs.

## 7.0 Marine fishing fleet

The total number of fishing vessels in 2008 was estimated at 41 733 numbers, of which 18 178 were traditional non-motorized boats and 15 847 boats were out-board engine fiberglass reinforced plastic boats (FRP) (*Table 8*). These two types of boats contribute to about 44 percent and 38 percent of the total fishing fleet in the country respectively. The increase in multi-day and one-day inboard crafts is 14 percent and 83 percent respectively (*Figure 5 on page 68*). Lifting of fishing barrier in the northern and eastern parts of the country and the accelerated investment in offshore/deep sea fishing are some of the main reasons for increase in the fishing crafts.



**Figure 4: Landing of major pelagic fishes in Sri Lanka**

**Table 8: Marine fishing fleet (Fishing boat census-2006/2007)**

Boat type	Number of Boats	Average crew size	Catch per unit Effort MT/Year
Multi-day Boats (Offshore ) IMUL	2 618	5	43.4
Inboard Single Day Boats IDAY	1 157	4	20.4
Outboard Motor FRP Boats OFRP	17 835	2	5.6
Motorized Traditional boats MTRB	1 854	2	6.1
Non-motorised Traditional Boats NTRB	18 206	1	1.5
Beach Seine Boats NBSB	1 008	2	11

Source: Statistic Unit , Ministry of Fisheries & Aquatic Resources Development.

Inboard multi-day boats are fishing in the deep sea, mainly focusing on large pelagic species, especially yellow fin tuna and big eye tuna for export market. The non- motorized traditional boats mainly operate to harvest small pelagic fish species. The local as well as foreign investment in deep sea fishing has increased over the years due to high profit margins. Therefore, the number of IMUL boats has also shown a continuous increase.

## 8.0 Fishing gear in use

The following box provides a matrix of different types of fishing gear in vogue in Sri Lankan waters.

Gill nets and Surrounding nets			
Drift gill net large mesh	Bottom set gill net	Beach seine	Purse seine
Drift gill net small mesh	Trammel net	Ring net	
Long line and Hand line			
Troll line	Hand line	Bottom long line	Stilt fishing
Pole and line	Shark long line	Tuna long line	Squid jigs
Trawl and Drag nets			
Shrimp trawl net	Drag net, Lift nets	Pots and Traps	
	Lift nets from boat	Crab pot	
Miscellaneous Gear			
Scoop net	Diving	Harpoon	Spear fishing

## 9.0 Fisheries infrastructure facilities

Sri Lanka has 13 main fisheries harbours. These fishery harbours are fully owned and operated by the Ceylon Fishery Harbours Cooperation (CFHC). A number of key services are provided within the harbour premises by CFHC to facilitate fishing and allied activities such as fish handling and marketing. At present only Mutwel and Galle Fishery harbours are able to provide landing facilities to foreign fishing vessels operating beyond the EEZ. The IMUL and IDAY boats use the harbours and anchorages for safe landing. The OFRP, MTR, NTR and NBSB mainly use landing sites for berthing and unloading their catches. There are about 1 081 minor landing centres in the country, which provide landing facilities for these crafts.

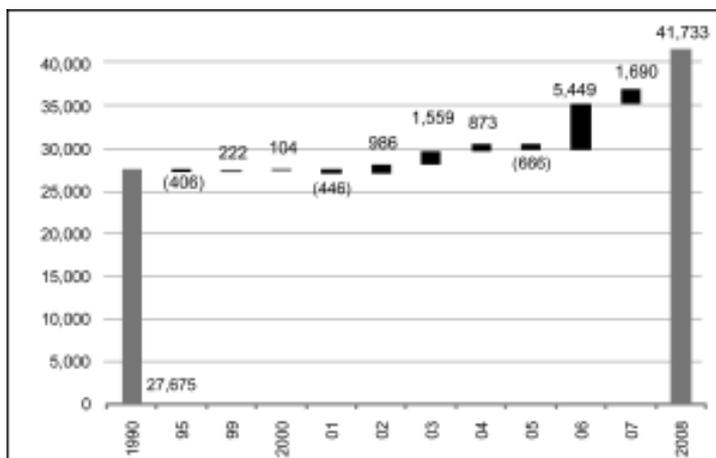


Figure 5: Growth of fishing crafts in Sri Lanka

## 10.0 Socio –Economic information on fishing community

Fisheries districts	15
Fisheries inspector divisions	143
Fishing villages	1 337
Fishing households	139 400
Fishermen	158 650
Fishing household population	664 820

*Source; Statistics Unit, Ministry of Fisheries and Aquatic Resources Development.*

There are about 552 active co-operative societies with 62 727 male and 17 485 female members and the share capital has now reached 14.5 million rupees. Batticaloa has the largest number of fisheries cooperative societies followed by Kalmunai and Jaffna.

## 11.0 Conclusion

Sustainable use of marine fishery resources is highly important for an Island nation like Sri Lanka and good fisheries management practices will play a pivotal role in sustainable use of the resources. To achieve this, sound data collection and analysis mechanism, participatory management planning, regulatory frameworks, input controls and operational and output controls are essential. Further, a comprehensive MCS regime should be in place to ensure that the management norms are effectively implemented.

It is now widely recognized that coastal fishery has already exceeded its maximum level of production. With the development of fresh water fishery, off-shore/deep sea fishery and culture-based fishery, options are now available in the fisheries sector to increase fish production and contribute to the fish requirements of the country. To further reduce the effort from coastal waters, it is essential to effectively utilize the deep sea resources such as tuna, lobster and other varieties of fish as also to engage in fishing in the international waters.





## **Legal and Policy Support for Implementation of Monitoring, Control and Surveillance in Marine Fisheries Sector in Sri Lanka<sup>1</sup>**

### **1.0 Introduction**

Fishing is a major economic activity and also the main livelihood of the coastal population in Sri Lanka since time immemorial. The fisheries and aquatic resources of the country are diverse and include a coastline of 1 770 km, an Exclusive Economic Zone (EEZ) of 517 000 sq. km and an area of 4 200 sq. km of inland waters comprising brackish water lagoons, estuaries and fresh water reservoirs. The continental shelf, which is comparatively narrow with an average width of 22 km, covers 30 000 sq. km. Under the UN Convention on Law of the Sea, Sri Lanka is entitled to claim an extended area of sea bed adjacent to the EEZ where the thickness of the sediment layer is over 1 km. According to estimates, Sri Lanka will gain an extended sea bed area equivalent to 23 times the land area of the country.

The total fishing fleet in the country is estimated at 43 768 (*Table 1*) out of which 90 percent belongs to the coastal fishery sector. In 2008, fish production was estimated at 3 19 120 tonnes and two-third of that came from coastal fisheries (*Table 2 - on page 72*). There are 12 fishery harbours, 37 anchorages and 700 fish landing centres and the number of active fishers is estimated at 1 50 000.

The fisheries sector has two main sub-sectors *viz.* coastal fisheries and offshore/deep sea fisheries. Coastal fisheries operate within the continental shelf area and is mostly undertaken by single-day motorized (FRP) and non-motorized traditional boats. It is also the dominant sub-sector in terms of contribution to production and employment generation. An estimated 80 000 fishers are actively engaged in fishing activities in this sub-sector and drift gill net is the most commonly used fishing gear. Offshore and deep sea fisheries take place outside the continental shelf up to the edge of the EEZ and in the high seas by multi-day boats. It is now a fast growing sub-sector and contributes to around 35 percent of the total fish production. Drift gill net and long lines are the commonly used gear in this sub-sector.

**Table 1: Growth of marine fishing fleet in Sri Lanka (2000-2008)**

<b>Boat type</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2008</b>
Offshore multi-day boats	1 430	1 572	1 614	1 530	1 581	3 385
3 1/2 ton day boats (28ft)	1 470	993	1 029	1 486	1 493	925
6-7m FRP boats (17-21ft)	8 690	8 744	9 033	11 020	11 559	17 138
Motorized traditional crafts	1 404	639	776	618	674	1 960
Non-motorized traditional crafts	15 109	15 000	15 600	15 040	15 260	19 431
Beach seine crafts	900	900	900	953	1 096	929
<b>Total</b>	<b>29 003</b>	<b>27 848</b>	<b>28 952</b>	<b>30 647</b>	<b>31 663</b>	<b>43 768</b>

<sup>1</sup> D S Nandasena, Assistant Director, Department of Fisheries & Aquatic Resources, Government of Sri Lanka.

**Table 2: Sector-wise fisheries potential and exploitation in Sri Lanka**

Fisheries Sector	Estimated Resource Potential	Current Production
Coastal	2 50 000	1 65 320
Off-shore	1 50 000	1 09 310
Total	4 00 000	2 74 630

## 2.0 National policy for development of fisheries sector

*Mahinda Chinthana* – the vision of the Hon’ble President of Sri Lanka is the guiding philosophy for development of policy framework for the country. The *Mahinda Chinthana* has given priority to develop fisheries sector and has envisioned Sri Lanka “*to become a leader in the South Asian region in sustainable utilization of fisheries and aquatic resources*”. In addition, *Mahinda Chinthana* specifically addresses monitoring, control and surveillance<sup>2</sup> (MCS) and identifies the need for reliable data on marine fish resources and their updating on continuous basis. Further, it identifies the need to improve fisheries and aquatic resources management processes through strong community participation and by organizing and strengthening Fisheries Cooperative Societies (FCSs) and building awareness. Similarly, it identifies the importance of efficient and effective Coast Guard services, including Vessel Monitoring System (VMS) and MCS to combat Illegal, Unreported and Unregulated (IUU) fishing in order to ensure sustainable fishing industry in the country.

The Ministry of Fisheries and Aquatic Resources Development (MFARD) which is mandated to develop fisheries sector has made the Ten-Year (2006- 2016) development policy framework in line with *Mahinda Chinthana* vision for fisheries sector. To meet national interests, the policy has the following objectives:

- To improve nutritional status and food security by increasing fish production;
- To minimize post-harvest losses and improve fish quality;
- To increase employment opportunities and improve socio-economic status of fishing community;
- To increase foreign exchange earnings from fish products;
- To conserve the coastal and aquatic environment.

The MFARD has also established policy objectives in line with *Mahinda Chinthana* to address MCS including importance of updating data and information. In addition, the Ministry is promoting co-management process as an urgent need to manage fishery resources through awareness building, community empowerment and strengthening of FCSs. The MFARD policy frame-work also stresses on the importance of Coast Guard service and VMS to enhance MCS mechanism and to eradicate IUU fishing.

<sup>2</sup> *Monitoring - Collection, measurement and analysis of information about fishing activity including catches, species composition, fishing effort, discards and area of operation, etc. The data and information are used to arrive at management decisions; Control - Specification of terms and conditions for harvesting resources. In other words, management measures or tools to manage fishing. These are contained in fisheries legislation and other arrangements and Surveillance - to conduct supervision of fishing activity to ensure compliance and as well protect resources from over-exploitation through implementation of management measures.*

### **3.0 Legal framework of fisheries sector**

Fisheries & Aquatic Resources Act No 2 of 1996 (F & AR Act, 1996) is the main legal document to cover almost all activities related to fisheries and aquatic resources in the country. The main purpose of this Act is to manage, regulate, conserve and develop fisheries and aquatic resources. From time to time, number of regulations has been made under this Act to introduce fisheries management measures or to address issues related to fisheries.

#### **3.1 Mandated institutes to implement the Act**

The Department of Fisheries and Aquatic Resources (DFAR) is mandated and responsible for implementation of the F & AR Act, 1996 and Regulations made there under. The DFAR has deployed authorized officers in all the 15 coastal districts of the country to implement the Act and its Regulations. Apart from DFAR officials, the following officials are also authorized under the Act:

- Any officer of the Army;
- Any officer of the Air Force or Police not below the rank of Sergeant;
- Any officer of the Navy not below the rank of Petty Officer; and
- Any officer authorized by the Director General/DFAR under Section 46(1).

#### **3.2 Key regulations related to MCS**

The following are the main regulations for implementation of MCS process:

- F & AR Act, 1996;
- Boat Registration Regulations, 1980;
- Fishing Operations License Regulations, 1996;
- Regulations for boat registration imposed in the Gazette No. 1430/4 on 30<sup>th</sup> January, 2006;
- Circulars and guidelines issued by DFAR;
- Other regulations to control specific fisheries (lobster, chank *etc.*); and
- Regulations to declare fisheries management areas.



### 3.3 *Process of Boat Registration*

The following sections of the F & AR Act detail the steps for the registration of fishing boats in Sri Lanka:

- **Section 15** – says that a Register of local boats will be maintained by the Director General of DFAR (DG-DFAR) and every owner of local fishing boat should register his boat in DFAR.
- **Section 16** – Where change of ownership of boat happens, it should be reported to DFAR.
- **Section 17** – Mortgage of local fishing boat shall be presented to DG-DFAR and DG-DFAR is responsible to register it in the registry of local fishing boats.
- **Section 18-23** These sections explain the process of mortgage registration.

### 3.4 *Boat Registration Regulations, 1980*

The following regulations explain briefly the registration process. Registration steps are more practically given in the regulations.

- **Regulation - 2** *No person shall use fishing boat for fishing without registration certificate in the Sri Lankan EEZ;*
- **Regulation - 3** *The boat owner or applicant should apply for registration;*
- **Regulation - 4** *Inspection of boat and issue of receipt for registration fee by authorized officer of DFAR;*
- **Regulation - 5** *Register the boat and issue certificate by DG/DFAR;*
- **Regulation - 6** *Issue of registration number by DG/DFAR;*
- **Regulation - 7** *Registration numbers should be painted on the boat by the boat owner;*
- **Regulation - 8** *Registration is valid for one year and it should be renewed annually;*
- **Regulation - 9** *Explains renewal of registration certificate;*
- **Regulation - 10** *Includes registration of boat transfer;*
- **Regulation - 11** *Explains registration on motorization;*
- **Regulation - 12** *Cancellation of registration;*
- **Regulation - 13** *Issue of duplicate copy of registration certificate;*
- **Regulation - 14** *Details process on how to do registration after death of boat owner.*

### 3.5 *Regulations for boat registration imposed in the Gazette No. 1430/4 on 30<sup>th</sup> January 2006*

This is the latest regulation introduced to meet the gaps in the existing procedure. In this amendment, new registration certificate, new application for registration and new valid time period for the registration, standard size of registration number, etc. are also introduced. Followings are the changes done in the regulations. Regulations 6, 7 and 8 are amended by this to make the following changes:

- *New registration numbers;*
- *Paint registration number properly;*
- *Registration valid for one calendar year;*
- *New application for registration; and*
- *New registration fee.*

### 3.6 Registration Fee

The Table below shows the fee that is charged for boat registration:

Boat category	Registration fee (Rs)	Renewal fee (Rs)
Boats with engine over 32"	500.00	250.00
Boats with inboard engine up to 32"	250.00	150.00
Boats with out board engine	100.00	50.00
Boats without engine	15.00	10.00

### 3.7 Requirements are indicated below for registration of boats

- Owner should be a citizen or more than 50 percent of shares owned by Sri Lankan;
- Receipts showing purchase;
- Seaworthiness certificate/declaration of survey report issued by MEA/DFAR;
- Relevant application filled (Fisheries 49); and
- Registration fee as per the category of boat.



### 3.8 Process and issue of Fishing Operation License Scheme

Fishing operation license is a management tool, which is a good way to control fishing effort. Almost all fishing operations are well identified and arrangements are in place to issue license only for suitable operations. Through this process, information such as fishing area, fishing effort, target species, etc. can be collected.

### 3.9 Legal framework and guidelines

Operation license scheme is well covered with a legal framework and other instruments such as departmental circulars and guidelines. Given below are key documents supporting sustainable development of fisheries in Sri Lanka:

- Fisheries and Aquatic Resources Act No 2 of 1996.
- Fishing Operations Regulations, 1996.



- Departmental Circulars.
- Other Instructions and Guidelines.

### 3.10 *Fisheries and Aquatic Resources Act No 2, 1996*

This Act is the main document to establish the foundation for the scheme. Important sections related to the licensing process are detailed below:

- **Section 6** - No person can undertake fishing operations without a permit issued by DG/DFAR or authorized officer.
- **Sections 7 and 8** - These sections include making request for permit and form of permit, validity period and conditions.
- **Section 9** - Renewal of permit is done only after satisfaction of the conditions stipulated in the permit (*e.g.* no threat to fish and aquatic resources from proposed fishing operation; due renewal fee is paid).
- **Section 10** - Cancellation of permit is due to non-compliance and if found guilty.
- **Section 11** - Cancellation or refusal to be informed properly.
- **Section 12** - Appeal to be made to the Secretary, MFARD, who is the final decision making authority.
- **Section 13** - No transfer can be done without approval from DG/DFAR or authorized officer.
- **Section 14** - These regulations are not *applied* to foreign vessels operating under Act No 59 of 1979.

### 3.11 *Fishing Operations Regulations, 1996*

These regulations are more practical and well explain the process of license scheme. The salient features are as follows:

- **Regulation No 2-** (a) No person shall catch, land, sell, buy or have in possession marine mammals or turtles and (b) following operations are prohibited:
  1. Push net fishing;
  2. Harpooning for marine mammals;
  3. Moxi net fishing; and
  4. Gill net or trammel net fishing on coral reefs and rocks.
- **Regulation 3-** Without a permit, no fishing operation can be done as specified in Part 1 of the schedule.
- **Regulation 4 to 8-** Procedures to issue permit is explained.
- **Schedule Part 1-** Fishing operations requiring license which includes 17 operations – (i) Seine nets fishing including madel and danish seine nets; (ii) Trawl net fishing; (iii) Surrounding net fishing; (iv) Trammel net fishing; (v) Gill net fishing; (vi) Drift gill net fishing; (vii) Long line fishing; (viii) Cast net fishing; (ix) Fishing by fish traps; (x) Stake net fishing (*kattu del*); (xi) Bivalve mussel fishing; (xii) *Beche-de-mer* fishing; (xiii) Chank fishing; (xiv) *Pila atu* fishing; (xv) Fishing by fish aggregating devices; (xvi) Lift net or atoli fishing and (xvii) Fishing by diving.

### **3.12 Operation license fee**

Charges for operation of licenses are based on the type of boat and the different boat categories and fee payable are given below:

<b>Boat category</b>	<b>License fee(Rs)</b>
IMUL	500.00
IDAY	400.00
OFRP	200.00
NTRB	50.00
NBSB	300.00
Gear without boat	25.00

### **3.13 Penalty for non-compliance**

Penalties include fine and imprisonment (as shown below); in addition fishing equipment are also liable to be forfeited.

- Not less than rupees two thousand fine for non-registration of boats; and
- Not exceeding six months imprisonment or not less than three thousand rupees or both for fishing without license.

### **3.14 Registration of boat yards**

- All boat yards should be registered with DFAR and the boat yard owners should apply for registration from DG/DFAR.
- Land, location and size; building design; space and arrangements; boat designs and environment protection license are considered by DFAR before registration.
- MEA/DFAR is responsible to inspect constructions regularly and ensure quality of boat.

### **3.15 Other provisions contained in the existing legal framework**

- Restriction on gear and mesh size and to control IUU fishing through operation of license. Restrictions could be put on fishing gear size, quantity, target species, fishing area, etc.
- Safety of fishers at sea (this is a new regulation).
- Dispute settlement through a process including appointment of authorized officers by DG/DFAR, implementation of decisions taken during the inquiry and so on.
- Control on import and export of fish and fish products and aquatic resources.
- Declaration of fisheries reserve in order to protect resources where necessary by the Minister of MFARD.
- Declaration of seasonal closure and area closure.

Following actions have been taken to avoid over-exploitation of resources and some specific management measures are as follows:

- Lobster permits to control catch of small size and protect egg layers, etc.
- Chank permits to control size and species;
- Prohibition on monofilament net;

- Restrictions on mesh size of purse-seine nets;
- Ban on fishing gear types such as push net, moxi nets, etc;
- Gear restrictions through operation of license regulations;
- Closure season for lobster;
- Declaration of some closure areas;
- Declaration of management areas;
- Setting up of some management committees;
- Formulation of management plans under process.

#### **4.0 Assessment of current management**

The present situation of implementation of fisheries management measures and tools show that while many functions have met with success, some others are yet to be operationalized fully. The following points illustrate the situation:

- Few management committees functioning;
- Boat registration is successful to meet targets;
- Operation licensing is successful to achieve targets;
- Other permits including lobster, chank, ornamental fish and *beche-de-mer*, etc. issuing is successful to meet the purpose;
- Considerable deterrent actions have been taken;
- No restrictions on open fishing access;
- Enforcement inadequate due to lack of capacity and resources;
- Very poor community participation and lack of commitment from the community;
- Poverty and lack of viable alternatives for the fisher community;
- Lack of reliable data and information on different aspects of the fisheries sector; and
- Lack of proper mechanism to address and review management issues on a continuous basis.



## 5.0 Implementation of MCS

The DFAR is the nodal agency in the Ministry tasked with the implementation of MCS programmes through its network of field offices in the 15 coastal districts of the country. The Department collects data and information on various aspects of MCS through its field offices and provides the same to the Central Statistical Unit of the MFARD for analysis and dissemination. The DFAR is also in the process of putting some management measures and tools in place, although adequate facilities for patrolling and law enforcement are lacking. The Navy and Police are supporting towards law enforcement and the newly established Coast Guard will further strengthen law enforcement.



## 6.0 Co-management

Co-management process is recognized as a policy and action has been taken to introduce it to the Sri Lankan fisheries. With the assistance of several foreign funded projects, steps are being initiated to create awareness building, organize fishers and hold consultations, declare management areas, form management committees and also formulate management plans for some fisheries.

## 7.0 Conclusion

Although there is adequate legal frame work for successful implementation of MCS, presently the gaps and issues are restricting the progress in successful achievement of the targets. Therefore, the following steps are proposed to achieve the objectives successfully:

- Empowerment of the community to an appropriate level to enable them to take decisions when necessary;
- Identification of actual stakeholders and to maximize their contribution;
- Strengthening of stakeholder consultation process to allow actual stakeholders to participate;
- Enhancement of capacity of mandated authorities/agencies/institutions to maximize their performance;
- Promotion of community participation in data collection;
- Contribution of armed forces and police in implementation of MCS;
- Enhancement of gender participation; and
- Strengthening of awareness building at all levels.

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## Salient Statistical Features of Fisheries Sector in Sri Lanka

**Table 1: Contribution of the fisheries sector to the GDP**

*(Rs Million at current market prices)*

Year	Total GDP	Agriculture, Livestock, Fisheries		Fisheries	
	Value	Value	Share (%)	Value	Share (%)
1990	3 17 904	72 788	22.9	5 859	1.8
1995	6 62 384	1 23 990	18.7	13 309	2.0
1999	10 08 845	1 91 577	19.0	22 960	2.3
2000	12 53 622	2 00 965	16.0	25 749	2.1
2001	13 96 314	2 14 482	15.4	27 535	2.0
2002	16 34 994	2 33 615	14.3	25 692	1.6
2003	18 19 228	2 41 336	13.3	30 159	1.7
2004	20 86 925	2 62 376	12.6	33 511	1.6
2005	24 39 328	2 90 071	11.9	19 227	0.8
2006	29 24 172	3 28 002	11.2	35 251	1.2
2007	35 78 386	4 17 353	11.7	55 010	1.5
2008	44 10 567	5 89 998	13.4	67 934	1.5

*Source: National Aquatic Resources Research and Development Agency. Fisheries Yearbook 2008. Colombo, Sri Lanka, 2009.*

**Table 2: Export performance of the fisheries sector in Sri Lanka**

Year	Total (Million Rs)	Fisheries Sector (Million Rs)	Contribution to Exports (%)
1997	2 73 360	7 978.00	2.92
1998	3 03 166	6 732.40	2.22
1999	3 15 580	5 130.90	1.63
2000	4 02 309	10 328.00	2.57
2001	4 14 558	8 920.00	2.15
2002	4 48 353	8 047.00	1.79
2003	4 75 992	9 542.50	2
2004	5 63 932	9 435.20	1.67
2005	6 19 497	10 696.00	1.73
2006	7 03 434	14 440.00	2.05
2007	8 48 643	19 123.00	2.25
2008	8 85 998	19 077.00	2.15

**Table 3: Food balance sheet of Sri Lanka (2008)**

Commodity	Production, foreign trade & availability (Tonnes)			Distribution (Tonnes)			Per capita availability			
	Production	Net import	Available supply	Non-food uses	Food gross	Food net	Grams per day	Calories per day	Protein (gms/ day)	Fat gms/ day
<b>Total Meat</b>	128.97	0.96	129.93	3.42	126.51	76.51	17.33	22.95	4.19	0.69
<b>Eggs</b>	51.91	0	51.91		50.98	50.98	6.98	12.08	0.93	0.93
1. Fresh Fish	291.05	-8.44	282.61		121.01	121.01	16.57	22.18	3.23	0.91
2. Dried & Salted Fish	36.2	51.75	87.95		87.95	87.95	12.04	29.5	6.11	0.48
3. Canned Fish		23.69	23.69		23.69	23.69	3.24	5.58	0.68	0.32
<b>Total Fish</b>		<b>0</b>						<b>57.26</b>	<b>10.01</b>	<b>1.71</b>
<b>Total Milk</b>	176.74	62.07	248.12	57.59	190.53	190.53	26.08	61.76	3.05	3.39

Source: Department of Census and Statistics.

**Table 4: Annual fish production of marine fish by fishing sub-sectors**

(in tonnes)

Year	Marine		Total Marine	Inland and Aquaculture	Total Fish Production
	Coastal	Off shore/ Deep Sea			
1980	1 65 264	2 148	1 67 412	20 266	1 87 678
1985	1 40 270	2 400	1 42 670	32 740	1 75 410
1990	1 34 130	11 670	1 45 800	38 190	1 83 990
1995	1 57 500	60 000	2 17 500	18 250	2 35 750
2000	1 75 280	84 400	2 59 680	36 700	2 96 380
2001	1 67 530	87 360	2 54 890	29 870	2 84 760
2002	1 76 250	98 510	2 74 760	28 130	3 02 890
2003	1 63 850	90 830	2 54 680	30 280	2 84 960
2004	1 54 470	98 720	2 53 190	33 180	2 86 370
2005	63 690	66 710	1 30 400	32 830	1 63 230
2006	1 21 360	94 620	2 15 980	35 290	2 51 270
2007	1 50 110	102 560	2 52 670	38 380	2 91 050
2008	1 65 320	109 310	2 74 630	44 490	3 19 120

Source: National Aquatic Resources Research and Development Agency. Fisheries Yearbook 2008. Colombo, Sri Lanka, 2009.

**Table 5: Marine fish production by major commercial groups**

Year/ Species	Aquatic Animals Nes Fresh	Cephalopods Fresh	Crustaceans Fresh	Demersal Marine Fish Fresh	Fresh water Diadrom Fresh	Marine Fish Nes Fresh	Molluscs Excluding Cephalopods Fresh	Pelagic Marine Fish Fresh	Other	Total
1990	62	241	5 098	21 951	26 765	42 784	n	89 037	n	1 85 938
1991	65	200	5 965	27 018	19 832	57 987	n	1 02 754	n	2 13 821
1992	65	200	7 783	28 176	17 500	39 935	n	1 13 687	93.1	2 07 439
1993	65	200	7 599	44 388	15 000	41 544	n	1 25 529	122	2 34 447
1994	92	250	4 900	44 460	9 500	44 135	n	1 46 234	236	2 49 807
1995	100	300	1 800	35 565	15 000	28 207	n	1 55 452	746	2 37 170
1996	150	300	2 502	36 922	22 250	36 404	n	1 65 030	723	2 64 281
1997	272	300	2 360	36 902	27 250	22 516	n	1 86 009	431	2 76 040
1998	203	300	880	37 710	29 900	31 197	n	1 88 853	603	2 89 646
1999	170	365	3 080	45 292	31 450	29 353	10	2 09 378	653	3 19 751
2000	145	310	230	49 290	32 340	13 630	15	2 19 996	698	3 16 654
2001	90	290	4 450	43 890	26 330	14 470	30	2 02 031	498	2 92 079
2002	150	380	7 530	49 073	25 570	8 467	60	2 05 943	324	2 97 497
2003	170	420	13 650	52 818	26 920	4 832	110	2 29 399	683	3 29 002
2004	280	380	15 320	44 099	30 780	10 471	250	2 31 780	588	3 33 948
2005	2 340	190	2 610	18 180	31 560	6 170	300	1 29 506	846	1 91 702
2006	1 350	120	7 090	18 870	35 290	10 820	120	2 00 365	557	2 74 582
2007	2 880	430	10 450	18 108	38 380	11 230	710	2 25 091	1 277	3 08 556
2008	4 230	480	11 780	17 080	44 500	12 850	1 420	2 35 235	1 953	3 29 528

Source: FAO Fisheries Department, Fishery Information, Data and Statistics Unit. FISHSTAT Plus: Universal software for fishery time series. Version 2.3.2000, n = negligible.

**Table 6: Operating fishing fleet by type of craft**

Year	Total Fishing Crafts	Inboard Engines		Out Board Engines		Traditional NTRB
		IMUL	IDAY	OFRP	MTRB	
1990	27 675	2 364	-	9 758	973	14 580
1995	27 269	1 639	1 357	8 564	1 060	14 649
1999	27 491	1 419	1 275	8 623	1 274	14 900
2000	27 595	1 430	1 170	8 690	1 205	15 100
2001	27 149	1 572	993	8 744	640	15 200
2002	28 135	1 614	1 112	9 033	776	15 600
2003	29 694	1 530	1 486	11 020	618	15 040
2004	30 567	1 581	1 493	11 559	674	15 260
2005	29 901	1 328	1 164	11 010	1 660	14 739
2006	35 350	2 394	907	13 860	1 842	16 347
2007	37 040	2 460	1 060	15 200	1 680	16 640
2008	41 733	2 809	1 940	15 847	2 959	18 178

*IMUL = Inboard Multi-day, IDAY = Inboard Single-day, OFRP = Out-board Engine Fiberglass Reinforced Plastic Boats, MTRB= Motorized Traditional Crafts, NTRB = Non-motorized Traditional Crafts.*

*Source: National Aquatic Resources Research and Development Agency. Fisheries Yearbook 2008. Colombo, Sri Lanka, 2009.*

**Table 7: First registration of fishing crafts**

Fisheries district	2003	2004	2005	2006	2007	2008
Puttalam	533	920	1 179	779	1 216	888
Chilaw	390	317	987	1 095	722	430
Negombo	483	411	1 337	572	653	437
Colombo	39	15	97	302	121	62
Kalutara	61	22	96	711	278	131
Galle	109	42	192	501	720	307
Matara	254	212	692	744	738	221
Tangalle	443	218	453	494	1,316	510
Kalmunai	235	280	990	704	506	505
Batticaloa	44	81	594	1 371	1 206	1 292
Trincomalee	240	131	437	2 180	1 005	1 080
Mullativu	0	0	0	0	0	0
Kilinochchi	57	78	108	193	0	0
Jaffna	334	617	583	1,933	148	637
Mannar	315	141	363	274	1 042	102
<b>Total</b>	<b>3 537</b>	<b>3 485</b>	<b>8 108</b>	<b>11 853</b>	<b>9 671</b>	<b>6 602</b>

*Source: Fisheries Management Division, Department of Fisheries and Aquatic Resource.*

**Table 8: Issue of licenses for fishing operations**

<b>Fisheries district/Year</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
Puttalam	237	679	2 568	2 922	3 527	4 457
Chilaw	107	390	1 630	2 157	2 263	2 044
Negombo	354	341	3 226	3 417	3 346	3 600
Colombo	14	39	183	535	736	634
Kalutara	133	88	229	977	723	944
Galle	56	57	244	597	1 211	1 396
Matara	143	208	948	1 640	1 916	1 679
Tangalle	237	131	672	723	2 244	1 887
Kalmunai	64	103	926	723	817	1 502
Batticaloa	44	149	501	1 193	1 424	2 385
Trincomalee	80	146	648	2 485	2 492	3 354
Mullativu	-	-	-	-	-	-
Kilinochchi	-	-	-	-	-	-
Jaffna	-	-	508	1 867	96	122
Mannar	120	33	530	720	547	1 150
<b>Total</b>	<b>1 589</b>	<b>2 364</b>	<b>13 813</b>	<b>19 956</b>	<b>21 342</b>	<b>27 162</b>

**Table 9: Fish landing sites by fisheries district-2007**

<b>Fisheries District</b>	<b>Harbours</b>	<b>Anchorage</b>	<b>Thotupala</b>	<b>Total</b>
Puttalam	1	4	61	66
Chilaw	-	1	59	60
Negombo	-	2	110	112
Colombo	2	-	24	26
Kalutara	1	-	37	38
Galle	2	2	90	94
Matara	2	4	23	29
Tangalle	3	2	39	44
Kalmunai	-	-	121	121
Batticaloa	1	-	187	188
Trincomalee	1	-	81	82
Kilinochchi	-	-	17	17
Mullativu	-	-	26	26
Jaffna	-	-	128	128
Mannar	-	-	50	50
<b>Total</b>	<b>13</b>	<b>15</b>	<b>1 053</b>	<b>1 081</b>

Source : Statistics Unit Ministry of Fisheries and Aquatic Resources, Census of fishing boats-2006/2007.

**Table 10: Current fisheries infrastructure facilities**

Fishery Harbours	13	
Anchorage	15	
Landing-Sites	1 053	
Ice Plants	75	(total capacity 1 367.3 tons/day)
Boat Yards	78	
Gear Factories	7	

Source: Department of Fisheries & Aquatic Resources (retrieved from [http://www.fisheriesdept.gov.lk/english/statistics\\_english.html](http://www.fisheriesdept.gov.lk/english/statistics_english.html)).

**Table 11: Basic fisheries information (Marine fisheries) - 2007 Estimates**

Fisheries District	Number of FI Divisions	Number of Fishing Village	Fish Landings	Fishing Household	Fishing Households Population
Puttalam	7	108	66	12 550	56 840
Chilaw	11	40	60	8 710	40 270
Negombo	13	82	112	13 110	62 030
Colombo	10	27	26	1 540	6 820
Kalutara	9	33	38	4 170	20 850
Galle	9	155	94	5 470	26 190
Matara	9	86	29	7 220	37 220
Tangalle	11	37	44	5 650	27 560
Kalmunai	12	258	121	17 160	82 120
Batticaloa	14	172	188	19 280	89 910
Trincomalee	9	120	82	15 170	76 970
Kilinochchi	5	40	17	2 100	9 870
Mullativu	4	31	26	1 500	7 050
Jaffna	14	107	128	16 740	78 680
Manna	6	41	50	9 030	42 440
<b>Total</b>	<b>143</b>	<b>1 337</b>	<b>1 081</b>	<b>139 400</b>	<b>664 820</b>

Source: Department of Fisheries and Aquatic Resources.

**Table 12: Number of active fishers by district**

<b>Fisheries District/ Year</b>	<b>1989</b>	<b>1996</b>	<b>1999</b>	<b>2004</b>	<b>2008</b>
Negombo	7 419	10 146	14 573	16 800	12 150
Colombo	1 610	2 235	2 653	2 800	1 830
Kalutara	3 157	4 150	4 322	4 200	5 080
Galle	3 590	5 134	6 304	6 300	6 210
Matara	4 426	5 120	5 276	7 100	8 140
Tangalle	3 354	4 843	7 001	6 100	6 940
Kalmunai	9 022	13 224	14 592	15 500	21 740
Batticaloa	12 843	13 533	15 137	21 600	24 840
Trincomalee	6 502	7 557	10 748	16 100	23 700
Mullativu	3 183	-	1 950	3 300	2 200
Kilinochchi	1 103	35 000	1 400	3 700	2 300
Jaffna	24 839	-	9 614	16 800	19 250
Mannar	5 684	-	4 593	9 400	11 120
Chilaw	7 173	8 039	9 090	10 000	10 760
Puttalam	4 539	9 795	13 161	12 100	15 210
<b>Total</b>	<b>98 444</b>	<b>1 18 776</b>	<b>1 20 414</b>	<b>1 51 800</b>	<b>1 71 470</b>

Source: National Aquatic Resources Research and Development Agency. Fisheries Yearbook 2008. Colombo, Sri Lanka, 2009.

**Table 13: Annual household income of fishing crew by type of craft, 2004**

Rs./year

<b>Source</b>	<b>Multi-day</b>	<b>In-board one day</b>	<b>FRP out board</b>	<b>Traditional</b>
Crew's fishing income	3 69 408	1 33 326	1 72 239	61 336
Family fishing income	42 492	88 750	37 768	33 394
Family non-fishing income	17 825	1 121	11 723	1 125
Total income	4 29 725	2 23 197	2 21 730	95 855

Source: Socio-economic and Marketing Research Division, NARA.





**BOBP/REP/120**

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