

4. REVIEW OF NATIONAL POLICY INITIATIVES AND FRAMEWORKS FOR FISHERIES RESOURCE DEVELOPMENT AND MANAGEMENT

This section reviews the policy framework which institutions are required to support. The principle focus of the section is in identifying strengths and weaknesses in policy, current activities, policy solutions, legal constraints and institutional support requirements.

4.1 The 10 year development program

The GoSL's Vision³⁵ is for *Sri Lanka to become a leader in the South Asian Region in sustainable utilization of fisheries and aquatic resources.*

Its policy objectives follow the national development doctrine and are:

- to improve the nutritional status and food security of the people by increasing the national fish production;
- to minimize post-harvest losses and improve quality and safety of fish products to acceptable standards;
- to increase employment opportunities in fisheries and related industries and improve the socio-economic status the fisher community;
- to increase foreign exchange earnings from fish products; and
- to conserve the coastal and aquatic environment.

The MFAR Ten year Development Policy Framework of the fisheries and aquatic resources sector 2007-2016 emphasizes a strong focus on private and public participation. The principal targets are to increase sector value added, increase employment, and to protect the fish stocks and the environment.

The strategies and actions proposed against the objectives are summarised in Appendix G.

These have been reviewed using a series of MFAR/ FAO coordinated Log Frame workshops to identify the requirements needed to support the plan's implementation, and to identify institutional support needs. The Log Frame process has applied the expected results, assumptions, activities, indicators to the above objectives. The workshops were divided into the following

1. Fisheries conservation & management (29th May 2007);
2. Marine fisheries economic development (employment & production increase & export promotion) (5th June 2007);
3. Aquaculture fisheries economic development (employment & production increase & export promotion) (12th June 2007);
4. Nutrition, Food Safety and marketing (7th June, 2007); and
5. Coastal zone protection (15th June).

The inputs to this work were made by Sri Lankan personnel drawn from the public and private sector. The Log Frame is provided in Appendix H.

³⁵ Mahinda Chintana 2006-2016

A summary of expected Results (Box 14) have been defined in order to guide the achievement of the MFAR ten year development policy over the next 10 years.

BOX 14: Ten Year Development Policy results

Fisheries management
Results: 1. Marine and aquatic resources monitored; 2. Management systems created and implemented; and 3. Fisheries control system operating effectively.
Coastal zone resource management
Results: 1. Coastal systems rehabilitated and enhanced; 2. Effective coastal management systems operating; 3. Coastal control systems operating effectively; and 4. Livelihoods of coastal communities improved.
Economic growth: Production, employment and value added
Results: 1. Fishery Cooperatives strengthened and expanded; 2. Conversion and expansion of tuna longline fleet; 3. New fisheries developed to target under-exploited fisheries; 4. Fisher capacity improved; 5. Shrimp sector strengthened & sustained; 6. Seasonal / Perennial tank production expanded; 7. Research programs initiated into the feasibility of small scale freshwater aquaculture systems; 8. Mariculture and inland cage culture expanded as an alternative livelihood in coastal and inland fishing communities; and 9. Aquatic plants and ornamental fish sector expanded.
Food Security and export growth
Results: 1. Food safety monitoring systems upgraded and maintained in full compliance with international and national food health standards; 2. Post harvest standards improved on multi day vessels; 3. Post harvest standards improved on coastal vessels; 4. Coastal landing sites, markets and inland fish markets upgraded and improved; 5. Cold chain extended in N&E provinces; and 6. Increased domestic market penetration achieved.

These results should to be integrated into the MFAR Action Plan. In addition to clarifying results and activities, the exercise identified the means of implementation, i.e. the appropriate institutions and private sector partnerships required to contribute to the development of the MFAR policy. In the case of fisheries and coast conservation, these cover the principal implementation bodies: DFAR, CCD and NAQDA allied to the principal stakeholders, the FCS, fish traders and exporters and other local organisations, supported by NARA (for research) and NIFNE (for training). In the case of economic development, the focus is primarily on MFAR, the Central Bank of Sri Lanka and BOI to facilitate the environment for investment, but on the stakeholders, fish farmers, exporters and fishers to undertake the implementation.

The following sections discuss the specifics of the operational requirements, making recommendations where appropriate for change in policy implementation processes, legal and institutional support requirements.

4.2 Fisheries conservation, management and control

A technical definition of fisheries management³⁶ is

‘the integrated process of information gathering, analysis, planning, consultation, decision making, allocation of resources and formulation and implementation, with enforcement as necessary, of regulations or rules which

³⁶ FAO Technical Guidelines for Responsible Fisheries No. 4. 1997

govern fisheries activities in order to ensure the continued productivity of the resources and accomplishment of other fisheries objectives'

Based on this FAO definition and international experience³⁷, fisheries management is the development and implementation of an integrated process called the fishery management plan that includes the following:

- setting policies and objectives for each fishery, stock or area to be managed; consulting and negotiating with users and interest groups, as participants in the decision making process, concerned with resources and from areas not directly related to fishery activities but which impact on fisheries;
- determining and implementing the actions necessary to enable the management authorities, the fishers and other stakeholder groups, to work towards achieving the identified objectives;
- building monitoring, control and surveillance mechanisms into the management framework
- in consultation with stakeholders, regularly reviewing the management objectives and measures to ensure they are still appropriate and effective;
- reporting to Governments, stakeholders and the public on the state of resources and management performance.

4.2.1 Fisheries management planning system

The FAO Code of Conduct for Responsible Fishing states the need for principles and the precautionary approach to fisheries management (Box 15). The MFAR Log Frame therefore demands that a structured approach, such as a fisheries management and planning system (FMPS) and recognition of the elements of the FAO Code of Conduct for Responsible Fisheries and the Precautionary Approach³⁸, be further developed and implemented in response to the above challenges (Table 17).

The world's best practice fisheries management and planning system and how the current approach by MFAR and the proposed Log Frame meet the FMPS requirements is briefly raised in Table 17. However, of the eleven components suggested, only a policy framework (2) and a registration system (4) are currently operational and of international standard.

BOX 15: Fisheries management principles

Principles of fisheries management (a)

1. Fisheries resources used in an ecologically sustainable way;
2. Fisheries resources managed for present and future generations;
3. A precautionary approach to the management and development of fisheries resources and based on best available scientific and related information;
4. Fisheries resources managed through fishery management and development plans;
5. Monitoring, control and surveillance mechanisms are an integral part of fishery management plans;
6. Limit access to fisheries resources recognized a means of obtaining sustainable development;
7. Optimal community, economic and other benefits obtainable from fisheries resources;
8. Access to fisheries resources is fair to all stakeholders;
9. Empowerment of communities, fisheries and other stakeholders in the fisheries resource management process through and participatory co-management (bottom-up with top-down) and traditional co-management (bottom-up) approaches;
10. Application of accountable and transparent decision making processes; and
11. Adherence to agreed international laws and conventions.

³⁷ Countries such as Australia and New Zealand

³⁸ FAO Technical Guidelines for Responsible Fisheries No. 2 1996.

The Precautionary Approach (b)

Taking into account the uncertainties in fisheries systems and taking action with incomplete knowledge, it requires consideration of the needs of future generations and avoidance of changes that are not potentially reversible;

1. prior identification of undesirable outcomes and of measures that will avoid them or correct them properly;
2. that any necessary corrective measures are initiated without delay, and that they should achieve their purpose promptly;
3. that where the likely impact of resources use is uncertain, priority should be given to conserving the productive capacity of the resource;
4. that harvesting and processing capacity should be commensurate with estimated sustainable levels of resource, and that increases in capacity should be further contained when resource productivity is highly uncertain;
5. all fishing activities must have prior management authorization and be subject to periodic review;
6. an established legal and institutional framework for fishery management, within which fishery management plans that implement the above points are instituted for each fishery; and
7. appropriate placement of the burden of proof by adhering to the requirements above.

(a) FAO 1995 Code of Conduct for Responsible Fisheries.

(b) FAO 1996 Precautionary approach to Capture Fisheries and Species Introductions. Technical Guidelines for Responsible Fisheries

It is against this international best practice FMPS and the FAO Code of Conduct for Responsible Fisheries, in the context of Sri Lanka's potential development and constraints, that institutional strengthening of the fisheries sector is viewed.

4.2.2 Strengths and weaknesses of current fisheries management

The current fisheries management regime overview is shown in Box 15. As indicated the regime system is narrow in terms of meeting the challenges facing fisheries management in Sri Lanka. as implied within the MFAR Log Frame – *SO1 - To conserve the coastal and aquatic environment (fisheries component)*³⁹ and underpin the need for strengthening the operational structure of fishing sector institutions. An overview of the strength and weaknesses of the regime is given in Table 18.

³⁹ Appendix D Table 1

TABLE 17: Fisheries management planning system

Key components for world's best practice for fisheries management planning	Article of FAO Code of Conduct for Responsible Fishing	Current fisheries management planning system of MFAR and focus on strengthening	Linkage to MFAR Log Frame ⁴⁰
1. Legal framework			
An effective fisheries legislation with modern approach and appropriate regulation provisions also compatible with international obligations	2 3 7.7.1 7.8 8.1.4 11.3	The current MFAR legislation includes the <i>Fisheries and Aquatic Resources Act No. 2 of 1996 and Amendment of 2004</i> ; and the proposed <i>2006 Draft Fisheries Bill</i> . <i>Neither contains provisions adequate for effective fisheries management and requires amendments.</i>	R2A3
2. Policy framework			
Strategic and operational policies for fisheries management within MFAR and institutional framework to carry it out (e.g. F&AR Council plus Fisheries Committees and Management Advisory Committees)	3 6 10	The MFAR ten year development policy is wide ranging and contains the framework for the development of the fisheries sector. <i>But is growth of the fisheries sector versus sustainable use of the resources clear.</i>	All results and activities.
3. Fishery management and development plans			
Formal Fishery management and development plans for the major fisheries include the strategies for sustainable development of a fishery, decision making processes, control measures, monitoring and research, compliance mechanisms.	7.1 -7.3 7.5 -7.6 10	Some marine Fisheries Management Areas have been Gazetted. No evidence of fishery management plans as yet. <i>The fishery management and development plan and related matters need to be incorporated into legislation and implemented.</i>	R2A1
4. Registration system			
Registration of all fishing craft/gear including registration number linked to licence to fish. A fundamental component of a fishery management plan.	8	A recent census of all fishing craft detailing location, owner etc undertaken during 2006. All Fisheries Districts, except the northern areas, Jaffna, Killinochichi, Mannar and Mullaitivu have been reported on and data base implemented.	R3A1
5. Licensing system			
Access to fishing grounds, fish stocks and use of specified fishing gear for all fisheries as conditions on a licence. All fishers using a Fisheries Management Areas should have licence and the number be limited.	8	Licence needed for: seine nets, trawl nets, surrounding net, trammel nets, gill nets, drift nets, long lines, cast nets, fish traps, stake nets, FADs and pila atu, lift nets, diving and for chank, bivalve, and beche-de-mer fishing operations. <i>Little action in limiting numbers of licences. Hence open access fisheries except for the beach seine fishery. The high seas fishery should allow for an increased number of licences until IOTC quota has been established. Licence numbers should be limited within designated fishery management areas/fisheries</i>	R3A1

⁴⁰ 'R' means Result and 'A' means activity within SO.1: to conserve the coastal and aquatic environment: fisheries and coastal components).

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Key components for world's best practice for fisheries management planning	Article of FAO Code of Conduct for Responsible Fishing	Current fisheries management planning system of MFAR and focus on strengthening	Linkage to MFAR Log Frame ⁴⁰
6. Monitoring system			
Monitoring of fishing fish catch and effort, fishing activities within various management areas, biological data collection, registration and licensing arrangements, boat positions and movements, use of safety gear, meeting international obligations such as Port State, exports and imports fish prices, ice plant production. This is base data for a management plan	4 7.4 8.1.3	NARA and DFAR collection of basic fishing activities and other data from other sources (export/import data) from which MFAR compiles and annual statistical report. <i>Limited biological data collected on main fisheries, assessment is based on data collection. Stock assessment regime needed for input into the development of fishery management and development plans.</i>	R1A2
7. Control system			
Control measures are the core feature of a management plan and include access arrangements and controls for gear, boat, season, area and fisheries reserves, species, catch, licence limitations, codes of conduct, MOUs	8 7.6	Controls relate to licensing, registration, open and closed seasons, gear, boats, species controls, types of fishing operation banned such as taking of mammals, push nets, moxi net, netting on coral reefs or rocks and use of monofilament nets. <i>Use of species controls, effort limits, and non-regulatory methods not used in marine fisheries.</i>	R2A1
8. Compliance system			
Compliance (surveillance and enforcement) is the means of checking on fishers accepting and obeying control measures. These include <i>preventative or voluntary compliance</i> using awareness and education, participatory management, peer pressure, verifiable data surveillance and verification of compliance. Voluntary compliance only effective if enforcement of non-compliance occurs. The other approach is <i>deterrent enforcement compliance</i> includes inspection, investigation, prevention and court proceeding to enforce the control mechanism.	7.7.3 8 11.2 - 11.3	Authorised Officers have wide ranging powers. <i>But shortcomings in meeting the requirements of best practice fisheries management and for offshore and high seas fisheries. Fisheries Inspectors have multiple tasks which restricts their enforcement role.</i> <i>Greater emphasis on voluntary controls needed.</i> <i>Use of VMS for high sea fishery to overcome the inadequacy of MCS assets such as personnel, patrol vessels and aircraft. VMS will help Sri Lanka meet the requirements of the UN Fish Stocks Agreement, FAO Compliance Agreement and FAO Code of Conduct for Responsible Fisheries.</i> <i>Needs to ensure that the agreement to promote compliance with international conservation and management measures by fishing vessels on the high seas is adhered to.</i> <i>Also needs to meet the FAO International Plans of Action to prevent, deter and eliminate illegal, unreported and unregulated fishing (IPOA-IUU) and upholding the Port State requirements.</i>	R3
9. Participatory processes			
The formal inclusion of key stakeholders in the decision making process based on co-management approaches. It is more than representation of stakeholders, top down or community based approaches. Usually	6.18	<i>Fisheries co- management is restricted due to the connection between designated Fisheries Management Areas and membership restrictions of Fisheries Committees. Few management areas have fisheries committees that are functional. Co-management principles neither espoused nor practiced except in a few inland reservoir fisheries. A major actor that can be involved in co-management is the role of Fisheries Cooperative Societies but conflicts of interest could occur.</i>	R2A2A5

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Key components for world's best practice for fisheries management planning	Article of FAO Code of Conduct for Responsible Fishing	Current fisheries management planning system of MFAR and focus on strengthening	Linkage to MFAR Log Frame ⁴⁰
<p>includes community empowerment in education/communication, Fisheries Committees and Management Advisory Committees.</p> <p>The rights of coastal communities and their customary practices need to be compatible with sustainable development and included in the planning process.</p>		<p><i>There is no co-management. Fisheries co-management provisions need to be included in the revised Bill.</i></p> <p><i>Role and composition of Fisheries Advisory Committee needs to reflect the co-management nature of fisheries management</i></p>	
10. Strategic and tactical research system			
<p>Tactical research is for finding solutions to immediate problems (e.g. stock assessments, habitat degradation) and strategic research for medium to long term matters (e.g. high seas technology development). Multidisciplinary research required for coastal zone management.</p>	<p>11.1.6 12</p>	<p>Only one fishery (Spiny lobster) has a stock assessment. Several internationally funded projects are designed to support the development of NARA stock assessment skills and assessment methodologies needed for supporting fishery management and development plans.</p> <p><i>The private sector is developing the offshore fishery and maybe partnerships should be developed for this research.</i></p>	<p>R1A1</p>
11. Fisheries development strategy			
<p>Post harvest technology, fleet improvement, seafood safety and quality (e.g. HACCAP), fishing gear technology, market access requirements.</p>	<p>7.5.4 8.9 8.11 11</p>	<p>The MFAR ten year development policy framework consists of a range of development activities such as food health and safety, product marketing and nutrition, post harvest standards and technology. Tuna fleet expansion, new fisheries and marine and inland aquaculture.</p> <p><i>Many of these development projects will require donor funding.</i></p>	<p>Various results of the entire MFAR Log Frame.</p>

Source: Various national fisheries management systems, Sri Lanka legislation and proposed MFAR Log Frame.

TABLE 18; Strengths and weaknesses of Sri Lanka fisheries management

Key challenge	Strengths	Weaknesses
Fisheries resource issues	<ul style="list-style-type: none"> Estimated maximum annual sustainable harvestable yield for the coastal area is 250 000 tonnes; Current catch level is under that estimate; Skipjack fishery stocks deemed sustainable by IOTC; and Precautionary approach is recognized by the Ministry in the ten year plan. 	<ul style="list-style-type: none"> Open access fisheries; Unknown annual sustainable harvestable yield for the offshore fishery; and IOTC has concerns about the Bigeye and yellowfin fish stocks.
Fisheries management system	<ul style="list-style-type: none"> <i>Fisheries and Aquatic Resources Act No.2 of 1996</i>; Fisheries Management Areas (FMA); Fisheries Management Committees; Full census of all fishing craft registered in all but the Northern District; Management regulations for 5 lagoon FMAs and 01 permanent reservoir; Inland fisheries management regulations; and MFAR and DFAR knowledge of fisheries. 	<ul style="list-style-type: none"> No application of fishery management plans; Shortcomings of <i>Fisheries and Aquatic Resources Act No.2 of 1996</i>; Lack of political awareness, bias and interference; No definition of user rights and other access arrangements; Lack of inertia within all relevant institutions; and Low drive to implement management systems.
Monitoring system	<ul style="list-style-type: none"> NARA data collection for MDB fishery; NARA collection of data and analysis of coastal fisheries; DFAR data collection through Districts; Inland fisheries data collection through NAQDA; and CIDA project to strengthen NARA stock assessment. 	<ul style="list-style-type: none"> Insufficient stock assessment expertise for analyses; Limited biological data collected on main fisheries; and No socio-economic data on viability of fishing craft businesses and impacts on local communities.
Control system	<ul style="list-style-type: none"> Licensing arrangements are in place; Regulations for the control of fishing operations; Regulations for foreign fishing boats; Regulation banning monofilament nets; Fishery management regulations for chank, lobster, sea shells and inland fisheries; Landing, handling and processing of fish; Fishing operations; Some shifting of fishermen to other means of income generation or other fisheries to reduce overcrowding of inshore fishing grounds; Export and import of fish and fish products; and Export of live fish. 	<ul style="list-style-type: none"> No limited entry fisheries in appropriate circumstances; Overcrowding in some fisheries showing signs of over-fishing; No assigned output controls where appropriate or internationally required; Lack of application of international environmental and fisheries management instruments; and Alleged foreign fishing boat activity.
Compliance system	<ul style="list-style-type: none"> MCS Unit in DFAR; District Inspectors active through local AD offices; Ad hoc arrangements with Coast Guard, police and defence personnel and infrastructure for inspection and enforcement services; New powers added in proposed Fisheries Act including international requirements; and High degree of peer pressure applied in some coastal fisheries. 	<ul style="list-style-type: none"> Similar enforcement activities by DFAR and NAQDA; Multi tasking of fisheries inspectors reduces effectiveness; Various fisheries demand different types of compliance; Powers of enforcement limited under the current Act Compliance (surveillance and enforcement) of control measures is inadequate on land; and Limited use of Coast Guard and Defence personnel and infrastructure at sea.
Participation of stakeholders	<ul style="list-style-type: none"> Some co-management for inland fisheries at local level involving Fisheries Cooperative Societies; and Under the CCD SAM process the fisheries sector has participation with designated SAM/APC sites. 	<ul style="list-style-type: none"> No participation by non-fishermen stakeholders under the FMA, FC arrangement; and Enhancing the empowerment of fishers and coastal communities as partners in building joint decision making fisheries management.

4.2.3 Lessons learned

4.2.3.1 Lessons learned in fisheries management in Sri Lanka

Implementation of fisheries regulations is the traditional response by the GoSL to the problems within the fisheries sector. However, a long term decline in fisheries resources productivity, over-fishing, excess fishing capacity, fisheries habitat destruction, resource allocation conflicts, and poor returns to fishers and the community will occur unless a precautionary approach is mandated.

Previous ways of managing fisheries within Sri Lanka waters (Box 16) have been based on the regulatory approach where stakeholders have been given the solutions to the problems of the fishery through regulations. Consultation with stakeholders is generally poor, leading to various levels on non-compliance with the regulations.

International experience⁴¹ suggests that effective fisheries management of Sri Lanka's fisheries resources (offshore, coastal and inland) is in using the participatory processes and the use of the fisheries management and development plans. The legal framework should be adjusted to incorporate all of the aspects of fisheries management including adherence to international obligations and adherence to the FAO Code of Conduct for Responsible Fisheries. The Log Frame design (research, monitoring and compliance) endorses this approach.

A review of the *Fisheries and Aquatic Resources Act No.2 of 1996 and Amendment of 2004* showed that the limitations of the provisions make fisheries management difficult. However, little proactive management or planning has occurred in the sector in the last ten years even taking into account the effects of the tsunami and impacts of the civil war as the priorities of the Ministry have changed.

The current fisheries initiatives are limited and reactive based on waiting for management problems to develop and then introduction of a regulation specifically for that problem or issue has been the rule rather than the exception⁴². Examples of pace and change and initiatives taken are as follows.

The management strategy (Box 16) based on Fisheries Management Areas was legislated in 1996. By 2007 a total of fifty seven sites (two coastal, four lagoons and 51 inland) have been declared as Fishery Management Areas. Fisheries Committees registered in three of these sites have been elevated as Fishery Management Authorities. Fisheries management regulations have been developed and adopted in three lagoons and two inland reservoirs with 20 other permanent reservoirs in progress. To facilitate and enhance fishing productivity twenty nine (29) small permanent reservoirs have regular stocking programs with 10 and increasing numbers of large/medium reservoirs undertaking stocking.

The experiences from the few community based fisheries management initiatives have not been very encouraging. Fishing communities, being at the lower end of the social strata, are often subjected to and are unable to resist the numerous socio-political pressures operating in the villages. Moreover, these groups have very limited access to professional advice and technical extension from DFAR, NARA, NAQDA and NIFNE.

⁴¹ Countries such as the Philippines have been using this approach for their coastal fisheries successfully.

⁴² Based on Leslie Joseph (personal communication) and meetings with DFAR and NAQDA staff.

BOX 16: Fisheries Management systems as currently applied in Sri Lanka

Fisheries Management Area:
A designated area of Sri Lanka waters or land adjacent thereto or both such waters and land.

Fisheries Committee:
Registered fishermen residing or migrant fishermen engaged in fishing in each designated *Fisheries Management Area* or part thereof can form a Fisheries Committee. The functions of a Fisheries Committee are: formulating and implementing a fisheries program for the area; assisting members to obtain fishing boats and fishing gear and carry out social and welfare activities to improve living standards of the fishing communities in that area.

Fisheries Management Authority:
A Fisheries Committee can become a Fisheries Management Authority that can make recommendations to The Minister responsible for the fishing on conduct of fishing operations, use of fishing gear, closed seasons for fishing or for specified species and times for taking fish within the designated Fisheries Management Area. A Fisheries Management Authority can be made up of more than one Fisheries Committee.

Fisheries Cooperative Societies:
Although not established under the *Fisheries and Aquatic Resources Act No. 2 of 1996*, Fisheries Cooperative Societies are made up of members of local communities, including fishermen, for the purpose of providing social and welfare activities through providing credit and saving facilities to improve living standards, some are highly involved in the fisheries management of inland tanks and support the role of fisheries inspectors in compliance.

Key regulations:

- Fishery Management Areas for Chilaw Lagoon, Negombo Lagoon, Rekawa Lagoon, Batticaolua Lagoon, Old Dutch Canal and Mundal Lagoon, Udukiriwili Reservoir;
- Fishery management regulations for chank, lobster, sea shells and inland fisheries;
- Landing, handling and processing of fish;
- Fishing operations;
- Foreign fishing boats;
- Export and import of fish and fish products; and
- Export of live fish.

Lessons learned:
Lessons learned from experiences during formation of the Fisheries Committees have suggested the following issues which made the Fisheries Committee approach, as specified in the *Fisheries and Aquatic Resources Act No.2 of 1996*, ineffective:

- Confusion over roles and responsibilities of Fisheries Committees and Fisheries Cooperative Societies;
- Village and ethnic representation on the committees not democratic or free of bias;
- Support of peers and village elders not often occurred;
- Many Committees were subject to social and political pressures;
- Inability of Committees to enforce agreed regulations;
- No provision for participation of other stakeholders in the management process;
- Fisheries Committee made up solely of fishers ability to implement their own fisheries management plan;
- Managing resources that are not localized but distributed over larger areas (e.g. tuna and other large pelagic fish).

(1) Inland fisheries and community-based management

The implementation of management arrangements for inland fisheries in the perennial reservoirs has provided some lessons. NAQDA, the agency with the mandate to manage inland fisheries does not have Fisheries Inspectors. Sixty Extension Officers undertake the compliance activities of these reservoirs but they currently have no enforcement powers and rely on the police to enforce the regulations. This will change under a new Fisheries Act. This is important because there is a high level of non-compliance in some reservoirs related to mesh size, use of monofilament nets and in some reservoirs, fishing by unlicensed fishermen.

Some Fisheries Cooperative Societies restrict the number of fishers able to operate in their reservoir (based on harvest or stocking levels and the financial commitment for stocking) and those that have been banned are therefore unlicensed. Political interference is high at the local level and there are monopolies created by fish traders. An ADB funded aquaculture project⁴³ is supporting the stocking programs of reservoirs, particularly seasonal reservoirs as a means of providing protein and livelihoods to rural communities.

The *Fisheries and Aquatic Resources Act No.2 of 1996 and Amendment of 2004* have provisions for community-based management of fisheries. Section 31 of the Act provides for the Minister to declare prescribed areas (inland water body, lagoon or adjacent sea area) as Fishery Management Areas. Section 32 provides for the establishment of Fisheries Committees composed of over 51 percent of the resident and migrant fishermen fishing in a Fishery Management Area. Under Section 32, a Fisheries Committee can be transformed into a Fisheries Management Authority. The Fisheries Management Authority can make recommendations to the Minister on fishing gear to be used in the management area, closed seasons and/or species to be taken and on fishing time.

A Fisheries Committee can be established only in a Fishery Management Area. The Act is not clear as to who should initiate the process; whether it is the Minister, the fishing communities or the DFAR. This may perhaps explain the very few attempts so far made since 1996 to introduce community based fisheries management according to the provisions of the Act. It may also be noted that the majority of these attempts have been through foreign funded projects, which have mobilized both the fishing community and the officials for such initiatives, as opposed to community based or Government led initiatives.

Conflicts have arisen between Fisheries Committees and the Fisheries Management Authority. Many Fisheries Committees are reluctant to enforce management regulations for fear of antagonizing the fishermen.

There are four key issues adversely affecting implementation of community based fisheries management in the above sites.

- Capacity of the Fisheries Committee to implement. Being only one group within a coastal community resources and willingness may be inadequate and as these Committees are comprised of only fishermen they are unable to withstand the various social, cultural and political pressures prevalent in the villages.
- Village /ethnic bias. When the fishing community is made up of members from different villages and/or ethnic groups, there was a tendency for village/ethnic bias in the development and implementation of management regulations. On many issues, fishermen were divided on ethnic/village lines (e.g. use of small mesh nets fishing outside agreed time limits), resulting in continued conflicts and friction between members of the fishing community, weakening the management process.
- Interaction with other FCS. Other than being legally empowered to manage fisheries, the Fisheries Committee Regulations, 1996 allow the Fisheries Committees to be involved in many other activities such as providing credit and welfare to fishermen and other community development activities that clearly overlap with activities of some of the existing fisheries societies such as the Fisheries Cooperative Societies. There had been resistance to the establishment of Fisheries Committees at some locations by those who run the Fisheries Cooperative Societies, for fear of losing their influence and control over fishing communities.

⁴³ ARDQIP (2003-2009)

- Non-participation of other stakeholder groups. The Fisheries Committee Regulations, 1996 permits only fishermen to be members of a Fisheries Committee. Other users of the water body are excluded and have no stake, role or responsibility in the fisheries management process. In inland reservoirs and tanks where irrigation needs and agriculture takes precedence over all other activities, the role and function of a Fisheries Committee would be limited unless it is well recognised and accepted by other stakeholder groups or is a part of a larger management mechanism involving all stakeholders of the water body.

(2) Coastal fisheries and community-based management

Apart from two lagoon areas little management has been initiated within coastal fisheries in recent years. The first attempt at introducing community based fisheries management under the provisions of the Fisheries and Aquatic Resources Act No. 2 of 1996 was at Negombo Lagoon, actively supported by DFAR through its UNDP/FAO Marine Fisheries Management Project. A total of 10 Fisheries Committees have been established to cater to over 3 500 fishermen scattered over 26 villages. Although the experience from the Negombo Lagoon has not been documented, it is reported that many issues have hampered the smooth functioning of the management process. However, DFAR concludes that the Negombo Lagoon pilot has good processes that provide lessons for application of participatory co-management in designated Fisheries Management Areas.

Other initiatives within the coastal fisheries have been the small boat coastal purse seine fishery. Experimental fishing using purse seines with light attraction in the night were conducted by a FAO/UNDP project in the 1970s. The recommendation to only allow a limited number of boats in the fishery went unheeded and the number of boats entering purse seine fishing increased rapidly in the east, south and southwest. In response to strong objections from the traditional beach seine and gillnet fishermen, the government introduced a licensing system in mid-1980s. The government in 1994 stopped issuing licenses to use purse seine nets, virtually banning them. However, the fishery is still continuing, albeit illegally while the DFAR, with limited compliance capabilities, makes sporadic attempts to control it.

Under CRMP a draft management plan for the spiny lobster fishery was developed through consultation with fishers, NARA and DFAR. To date, the draft management plan has not been acted upon.

(3) Offshore and high seas fishery

This important fishery is managed through registration of the fishing boat and under a fishing licence for fishing operations carried out by gill nets and long lines, landing of fish regulations and prohibition on taking of marine mammals and turtles. Under UN regulation shark fining is prohibited. An attempt under the CRMP project was made to develop a draft fishery management plan for the MDB fishery. Consultation was undertaken with the key participants at Beruwala and Negombo and DFAR and NARA staff but no progress was made. There are currently 2 613 multi-day boats registered according to the 2006 MFAR fishing boat census.

NARA is currently monitoring the landings of MDBs to provide data to IOTC for stock assessment and for MFAR Statistical Unit publications. As yet, there has been no application of that data to manage the fishery. However, in the future the IOTC will probably put pressure on GoSL to effectively manage this fishery through the quotas likely to be imposed.

4.2.3.2 Lessons learned in fisheries management in other countries

Fishery management systems applied in other in countries illustrate a range of restrictions on access, vessel size, fishing gear, limits on days at sea and catch. Examples are illustrated below (Box 17) which provide an indication of systems applied.

BOX 17: International examples of control systems

Fishery	Control systems
Inland	Licence restrictions (Most countries). Types of vessel (Most countries). Closed seasons (Danube, European Salmon fisheries). Ban monofilament nets (UK & Norway salmon fisheries, Caspian Sea sturgeon). Minimum mesh and landing sizes (African Lakes).
Coastal	Types of vessel & engine sizes (Most countries). Prohibiting certain methods e.g. trawling, beach seining, push nets (Most countries). Licences & registration (Most countries). Community quotas (New Zealand Mauri). TURFS (South African abalone fishery). Limited licensing / quotas / collection areas for fisheries (Beche-de-mer, ornamental fish, lobsters Great Barrier Reef Marine Park and other jurisdictions in Australia). Effort control (Iceland). Closed seasons (Most countries). Protected areas (Great Barrier Reef Marine Park). Banning monofilament nets (Australia). Minimum mesh and landing sizes (Most countries). Length of nets & number of hooks (Most countries). Number of pots (Lobster fishery, Australia). Use of TEDs & by-catch exclusion devices (Selected trawl fisheries in S & SE Asia, Australasia). Banning catch of female / berried crustaceans (Selected fisheries in Australia, UK).
Offshore	Restrictive licensing (All countries including West Africa and Southern Africa). Competitive quotas (Pacific tuna fisheries, Canada). Individual transferable quotas (Iceland, New Zealand, UK, Netherlands, selected fisheries in Australia). Effort units (days/boat capacity limits) (Australian Queensland trawl fishery, EU beam trawl and trawl fisheries). Transferable effort units (Queensland, UK, Netherlands). Types of fishing gear (Trawl bans, Indonesia). Excluding devices (Canada, Norway, SE Asia & Pacific). Hook limits & gill net length / sizes (Australia). Tradable net limits (Australia).

Specific systems as could be applied in Sri Lankan fisheries are also elaborated in Appendix I, Table 5). Some general conclusion vis a vis application of the above types of controls to Sri Lanka fisheries are as follows:

Inland fisheries: Sri Lanka applies many of the input restrictions used in other countries.

Coastal fisheries: Sri Lanka applies many of the input restrictions used in other countries, excluding community quotas. *No limitations are set for output controls* in Sri Lanka. Effort control systems as applied to inland fisheries require corresponding restrictions on technical measures which will prevent increases in efficiency. These are usually applied retrospectively. Examples of licence restrictions and quota controls exist for beche-de-mer and lobster, and licensed limitations and collections zones exist for ornamental fish in Australia. TURFS exist in abalone fisheries in South Africa.

Offshore fisheries: Sri Lanka presently applies some technical restrictions (length of gill net and mesh sizes). *No output or effort controls are applied*. In some countries where these controls are applied, most management regimes have evolved to individual trading quotas and effort units. Enforcement of quotas requires a significant land based control system. Enforcement of

technical measures requires the support of offshore compliance deployment categories. Enforcement of closed areas requires the additional support of technology such as VMS. Effort control systems also require a combination of additional technical controls to prevent increases in efficiency, and electronic monitoring as and when fishing in different zones. As and when there are international or fisheries partnership agreements for straddling stocks, national quotas are implemented, e.g. IOTC.

4.2.4 Fisheries management systems and their effectiveness

Fisheries resource management is multidimensional. It is about the social, economic, biological, environmental, ecosystem, cultural, and governance dimensions of this relationship. The outcomes and impacts of fisheries resource management are therefore complex and difficult to achieve. Therefore it is important to review the current fisheries management systems available to Sri Lanka and their effectiveness.

4.2.4.1 Monitoring, stock assessment and research system

The basic challenge facing fisheries management is the collection of relevant data. Monitoring relates to gathering of data on all aspects of fish stocks, fisheries habitat, fisheries operations and fisher actions relating to compliance with control measures (Table 19).

Monitoring is essential because it provides the information needed to assess the performance of a fishery management plan in achieving agreed objectives. Basic to understanding the impact of fishing mortality on the sustainability of fish stocks it is important to know the status of fish stocks through stock assessment and biological research.

However, very little current and reliable information is available on the coastal fish resources of Sri Lanka; NARA has been building landing data for the offshore fishery. But the last stock assessment of the coastal fish stocks was by the 1979/80 RV *Fridtjof Nansen* surveys that estimated the maximum sustainable harvestable yield was 250 000t comprised of 170 000t of pelagic fish and 80 000t of demersal fish⁴⁴. A stock assessment of spiny lobsters by NARA in 1999 indicated that the MSY for that fishery is 126t. Other supporting *ad hoc* studies have been carried out by NARA. Clearly, further resource surveys and stock assessments are required.

4.2.4.2 Control system

There are four forms of control mechanisms: natural controls, input controls, output controls and compliance controls (Table 22). The general outcome described in fisheries management literature and the experience in many countries is that input controls without being in combination with the other effort limit mechanisms, can lead to stock depletions, excess capacity, ecological damage, reduced biodiversity, reduced profits, social dislocations and management failure as fishery objectives are not achieved because fishermen can change fishing operations and technology to overcome these controls.

However, effective fishing effort is difficult to quantify and consequently manage as fishers have an incentive to replace restricted inputs for unrestricted inputs to improve their relative competitiveness for a share of the catch. The most significant recent technological change has been GPS which has led to better locating of tuna and tuna-like fishing grounds and therefore lead to the expansion of the fishing grounds.

⁴⁴ MFAR Ten Year Development Policy Framework p.11.

4.2.4.3 Compliance system

An essential component of fisheries management is ensuring the compliance of control measures of a fishery. However, the development of the Sri Lanka fishing sector provides challenges for a compliance system including:

- the negative results of a centralized, micro-managed control mechanisms;
- the impact of devolution of management authority of coastal resources to participative co-management and the use of lower levels of government;
- inability of governments to undertake surveillance through lack of personnel and infrastructure;
- inappropriate powers of enforcement legislation;
- coordination between agencies involved in compliance activities;
- different spatial areas to be managed (e.g. EEZ and coastal zone);
- different fisheries to manage and control;
- different fleet structures - foreign vessels and landing, MDB to traditional;
- internal and inter-agency influences such as the role of the Coast Guard and Police;
- influence of socio-economic and cultural influences;
- impact of the civil war; and
- political will to legislate power, undertake enforcement and prosecute for non compliance.

Very little compliance control activities are carried out for Sri Lanka⁴⁵.

4.2.5 Proposed changes to fisheries resource management systems

It is proposed that the following components of an effective fisheries management system be part of institutional strengthening of Sri Lanka's approach to fisheries management:

- fishery management and development plans;
- strengthening of monitoring, stock assessment and research systems;
- strengthening of control systems;
- strengthening of compliance system;
- co-management; and
- voluntary Fishery Codes of Conduct for Responsible Fisheries.

A framework of fisheries management has also been proposed for inland, coastal and offshore/high seas fisheries (Table 24) based on the following changes.

4.2.5.1 Fishery management and development plans

The fisheries management and development plan (Table 19) is a fundamental key to effective fisheries management of Sri Lanka's offshore, coastal and inland fisheries resources as it incorporates a legal framework that ties together all of the elements of the MFAR Log Frame.

The international trend is compliance⁴⁶ with monitoring and controls being key elements of plans and not a separate unit outside of management.

⁴⁵ Some forms of compliance controls are effective for a small number of reservoirs, but not for marine fisheries according the DFAR staff.

⁴⁶ A Compliance Unit deals with voluntary and deterrent arrangements. However, the role of MCS is a powerful tool for fisheries management given management plans do not exist. MCS is not fisheries management but a component albeit critical.

A proposed set of guidelines for legislation relating to establishing fishery management and development plans is provided in Appendix I Table 4. These include statutory requirements, compulsory contents and discretionary contents and are based on examples of best practice legislation⁴⁷.

The introduction of these plans will strengthen the MFAR's ability to create the right policy framework and engage in sustainable development of fisheries and aquatic resources.

4.2.5.2 Strengthening of monitoring, stock assessment and research system

The role of NARA is important as NARA is currently doing a systematic stock assessment of the large pelagic and billfish fisheries by monitoring the landing of fish from multi-day boats and coastal boats. This information is also provided to IOTC and is important to establishing harvest rights in the Indian Ocean.

Given the pressure of coastal community fishing on coastal fish stocks, there is a need for stock assessments and catch per unit effort data to be collected from these fisheries. NARA needs to increase their monitoring to include these coastal fisheries to improve their data collection, analysis capability and stock assessment methodology, in order to support the planned growth of these fisheries and supply monitoring data to support the development of fishery management plans.

This capability will be provided through FAO technical assistance (with funding from CIDA) and IFAD funding with priority given to the shrimp, lobster, ornamental, chank and beche-de-mer fisheries. The projects⁴⁸ will provide data and information on fish stocks, their biology and environment, and impacts on critical habitats, protected and vulnerable species and will develop the capacity of coastal communities and DFAR to develop fishery management plans based on these and other data.

The proposed strengthening the monitoring aspects, stock assessment and research system are provided in Table 20.

⁴⁷ Examples include Australia and New Zealand who have successfully developed and implemented fishery management plans supported by legislation.

⁴⁸ Project Proposal: 'Capacity enhancement of NARA for marine resources surveys and stock assessment in coastal waters of Sri Lanka' (GCP/SRL/054/CAN). funded by Canadian International Development Agency (CIDA), 2007 and stock assessment component under the IFAD Pt-CRRMP Programme.

TABLE 19: The components of a fishery management and development plan

Fishery management and development plan components	Strengthening requirements
<p>Description of the fishery The description of the fishery provides important background information as it <i>sets the benchmarks for measuring changes in the fishery</i>. It describes the boundaries of the fishery and main fishing grounds, main species taken with catch and effort data, the types of fishers and gears used and other stakeholders involved. It also provides general information on the biology and habitat of the target species and the environmental issues such as habitat destruction from fishing gears and ecosystem concerns, such as impacts on biodiversity, related to the fishery. As fisheries management is also concerned with the people associated with the taking, handling and marketing of lobsters, general demographic information should also be provided as part of benchmarking the fishery.</p>	<p>The main areas described are:</p> <ul style="list-style-type: none"> • Area of application of the plan • Target species and associated dependent species • Fishing methods • Social, economic and cultural information relating to fishery participants • Environment and ecosystem information • Description of post harvest sector and health issues.
<p>Status of the fishery The status of the fishery provides important assessment information as it sets the benchmarks for management measures for the fishery.</p>	<p>Areas that could be assessed are:</p> <ul style="list-style-type: none"> • Assessments of relevant fish stocks • Socio-economic status of the fishery participants • Ecological and environmental status of the fishery.
<p>Jurisdiction Jurisdiction provides information on who is legally responsible for managing the fishery and legal obligations that need to be met.</p>	<ul style="list-style-type: none"> • Levels of government, agencies and their roles in the fishery • Formal and informal agreements between levels of governments; on fishery management • Other Regulations and fisheries laws affecting the fishery • International laws and conventions, participatory processes and co-management.
<p>Objectives of fisheries management The objectives of the plan are very important because these set what the stakeholders want to achieve by having the fishery managed. Therefore the objectives must be simple and clear. To ensure that the success or otherwise of the achievement of an objective can be determined, each objective or group of related objectives must have at least <i>one performance indicator</i> and a <i>response trigger point or reference point</i>. Performance indicators are criteria by which success of the objectives can be measured. At present, in Sri Lanka the use of these indicators will be limited by the ability of fisheries administration to collect the required data. A performance indicator gives a guide to the direction of changes taking place in the fishery. However, performance indicators are data hungry so care needs to be taken to choose indicators that rely on data that can be simply and easily obtained. However, there need to be criteria which clearly state when action needs to be taken when changes in the fishery occur. Trigger points and reference points provide the criteria for action to be taken. Decision about what changes need to be made in the management of the fishery may be described in the plan or be part of the review process. Technical details of the data needs and analysis required to determine these performance trigger and reference points is not provided in this manual⁴⁹.</p>	<p>Examples of key objectives (italics) and trigger points for action (parentheses) for the management of a fishery may be:</p> <ul style="list-style-type: none"> • Biological – <i>the protection of spawning fish stocks</i> (catch falling below agreed proportion of MSY of target species) • Social – <i>increased employment opportunities for coastal villages</i> (decreased number of villagers employed in the fishing sector) • Economic – <i>reduction of debt of village fishers</i> (falling proportion of fishers owning their boats) • Environmental – <i>the protection of fisheries habitat</i> (increased proportion of fisheries habitat area lost) • Ecosystem – <i>reduction of by-catch</i> (increase over agreed proportion of by-catch in total catch) • Cultural – <i>maintain the use of traditional fishing boats in the fishery</i> (fall in current proportion of traditional boats in the fishery) • Governance – <i>increased participation of fishers in management</i> (decrease in attendance at industry/management meetings).
<p>Control measures Control measures are the key to fisheries management and range across a variety of options. These</p>	<p>Suggested control measures include:</p> <ul style="list-style-type: none"> • Access arrangements– who can fish • Registration - marking of boats and/or registration of fishers

⁴⁹ Refer to ‘Reference Points for Fisheries Management’. FAO Fisheries Technical Paper 347, (1995). and ‘Indicators for Sustainable Development of Marine Capture Fisheries’. FAO Technical Guidelines for Responsible Fisheries 8, (1999).

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Fishery management and development plan components	Strengthening requirements
<p>management measures must relate to the objectives of the fishery and are the actions needed to achieve the agreed objectives of the plan. Control measures constrain or encourage the actions of fishers. Options chosen depend on the type of fishery and issues that need to be resolved.</p>	<ul style="list-style-type: none"> • Licensing – licensing access and harvest (e.g. area, gear, species, landing at harbours), different fees for different activities; • Input controls – numbers and type of gear used, number and type of boats, mesh size, fishing zones • Marine protected areas - area closures, seasonal closures • Output controls - quota for boats, areas; species quota, limited species for each type of gear • Reporting requirements – logbooks, data collection methods • Codes of conduct - agreement by fishermen to do the right thing with no sanctions except social and moral obligation • MOUs between fishermen and other stakeholders.
<p>Fisheries research Need for research (if any) must be strongly linked to the achievement of the objectives of the plan.</p>	<p>Suggested priorities could be:</p> <ul style="list-style-type: none"> • Stock assessments of key species • Specific assessments of aspects of the fishery (e.g. changes in gear specifications, socio-economic, environmental, etc.) • Implications for management – continuous improvement based on best available information.
<p>Monitoring of the fishery (data collection and analysis) Monitoring of the fishery is essential because it provides the information needed to assess the performance of the plan in achieving the agreed objectives. Data collection is therefore important and is a priority need of fisheries management.</p>	<p>The data related to implementation and success of a plan may include:</p> <ul style="list-style-type: none"> • Registration of fishers, boats and gear • Fishing licence and permits • Boat marking according to registration requirements • Catch and effort and movement of boats • Use of harbours and landing centres • Species taken including bycatch and fishing gear used in management area • On-board safety gear and other equipment required under any surveillance and enforcement arrangements • Information on fishermen not adhering to this fishery plan • Indirect impacts relating to fishing activities (habitat destruction, non-target species, environmental effects, etc.) • traditional fishing activities • Illegal fishing and related activities • EEZ and high seas fishing and related activities • Position, nationality and movement of fleets within the EEZ; • Details of licences issued to foreign fishing vessels. • MCS arrangements within the country • Enforcement activities • Market information • Vessel, skipper and crew information • Subsidies to villages and boat owners by the government • Compliance with international conservation and management measures.
<p>Compliance (surveillance and enforcement) The success of fisheries management is based on understanding and acceptance of stakeholders that fishers comply with the control mechanisms of the plan. Fish cannot be managed but fisher</p>	<p>Some suggestions are:</p> <ul style="list-style-type: none"> • Voluntary compliance arrangements • Process of enforcement of regulations and rules within this plan

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Fishery management and development plan components	Strengthening requirements
actions can.	<ul style="list-style-type: none"> • Capacity building and training needs specific to surveillance and enforcement of the fishery • Contingency arrangements for low probability major impact events.
<p>Consultation and extension with stakeholders</p> <p>Stakeholders must be aware of and agree to the process of consultation needed to develop the plan and the importance of extension.</p>	<p>Some areas that might be included:</p> <ul style="list-style-type: none"> • A communications strategy to detail the role, responsibilities and function of the fisheries department/agency • As appropriate, an inter-agency consultation mechanism • A mechanism for regular consultation with stakeholders • A public relation strategy, including sensitizing political leaders and senior government officials • Participation processes clearly stated • Role of DFAR, NARA, NAQDA in the consultation process • An effective extension strategy • Information flows – IEC and role of various committees • Improving public awareness and acceptance • Involvement of stakeholders in management planning and its implementation of (MCS).
<p>Post Harvest sector</p> <p>One of the major weaknesses in the development of Sri Lanka's fisheries is lack of understanding of post harvest activities.</p>	<p>The management plan should emphasize the need for:</p> <ul style="list-style-type: none"> • Improved fish handling on board boats • Fish processing facilities • Meeting international quality assurance, safety and health requirements such as HACCP • Implications of the post harvest sector for fisheries management.
<p>Development of the fishery</p> <p>The development of a strategy for development of the fishery through stakeholder participation</p>	<p>Some aspects for consideration may include:</p> <ul style="list-style-type: none"> • Improved technology • Environmentally friendly fishing methods and gear • Better boat design • Fisheries infrastructure • Better marketing arrangements.
<p>Obligations and responsibilities of stakeholders</p> <p>Stakeholders must share jointly the management of fishery resources and assume responsibilities.</p>	<p>These include:</p> <ul style="list-style-type: none"> • Being active partners in the management process • Negotiate fishery management plans • Obey the rules of the plan • Provide catch and effort data • Develop the fishery sector • Seek better fishing methods • Use environmentally friendly fishing gear.
<p>Amendment and review of the plan</p>	<ul style="list-style-type: none"> • Basic principle of continuous improvement based on best available information • When and how plan to be reviewed (basis for changing the plan or the management measures related to objectives and performance indicators and triggers) • Who has responsibility for the plan and its review.

Source: Taylor-Moore, N., (2002). International Fisheries Management Special Final Report. ADB TA No. 3477-SRI

TABLE 20: Strengthening of monitoring, stock assessment and research systems

Data requirement	Application to fisheries management	Strengthening requirements
1. Biological/ecosystem data		
<ul style="list-style-type: none"> • Biological data of target fish species; • Biological data of by-catch species; and • Fisheries habitat. 	The life cycle of fish is basic to understanding for spawning areas, growth rates and spatial distribution of fish. Each of which determines the catchability of fish and thus the need for appropriate control mechanisms to limit fishing mortality.	NARA research on impacts on fisheries productivity and stock changes for only key species.
2. Fishing effort data		
<ul style="list-style-type: none"> • Fisher numbers; • Number of boats in fishery; • Catch per boat types; • Catch composition; • Species catch and size; • Catch and effort data; • Days fished; • Areas fished; • Fishing gear usage; modifications; and • Logbook data. 	Controls on fishing operations that limit fishing mortality or protect certain aspects of the life cycle of fish. Reduction of immature fish in catch Management planning requires this data to ensure that fishing mortality and the behaviour of fishing boats and fishers are related to the objectives of the fishery such as sustainable use of fisheries resources.	Collection System within District with Advice from NARA and DFAR. Avoid duplication of collection efforts.
3. Socio-economic data		
<ul style="list-style-type: none"> • Cost/earnings data of fishing operations; • Census data; • Market data; • Fish prices; and • Imports and Exports. 	The outcome of fishing is to gain wealth and income for fishing communities and the contribution of the fisheries sector to the Sri Lankan economy. Fishing is a business and sustainable profit is a major aim of the fishing operation.	Survey expertise developed within NARA and DFAR.
4. Compliance data		
<ul style="list-style-type: none"> • Registration of boats and boat markings; • Licence details; • Boat harbour and fish landing site data; • Boat positions and movements; • Inspections; • On-board safety equipment; • Non compliance activities; • Cases filed and prosecuted; results; and • Port State data. 	Compliance, either voluntary or by deterrent, requires monitoring data to improve the effectiveness of the government ensuring that the fishing sector complies with the control and safety measures placed on fishing operations. These obligations are both national and international such as those under IOTC and other UN laws and conventions.	Creation of a Compliance Unit. District inspection program linked to Compliance Unit.

4.2.5.3 Strengthening of control systems

Another form of control relates to quantity of fish that can be harvested through the use of quota controls such as Competitive Quota System (CQS), Individual Quota System (IQS) and Individual Transferable Quota System (ITQS). A brief comparison of these forms of wealth creating management mechanisms and their applicability to Sri Lanka indicates that quota management may be beyond the financial and people resources available and needed (Appendix I Table 5) but the IOTC may make it mandatory for at least one of these systems to be applied to the MDB fishery.

(1) Competitive Quota System (CQS) based only on a total allowable catch (TAC)

A CQS is a basic approach to controlling over-fishing of highly valued fish species such as tuna and lobster. By setting an upper limit on the harvest of the species, based on appropriate biological objectives and reference points, the sustainability of the fishery can be achieved in the long term. A competitive time quota to the whole fishery is equivalent to various forms of seasonal closure. The TAC is not allocated to individual boats so there is a 'rush to fish' until the TAC has been reached.

(2) An Individual Quota System (IQS)

An IQS is based on a TAC or time limits which are fundamental to controlling over-fishing and lead to sustainable fish resources. By setting an upper limit on the take of a species or the time limit such as total days fished by an individual boat operating within the fishery, an individual boat may remain in the fishing grounds. Based on appropriate biological objectives and reference points, the sustainability of the fishery can be achieved in the long term.

(3) Individual Transferable Quota System (ITQS)

An ITQS is a management system where individuals are allocated a specific share of an annual TAC or of a time quota that has a strong property right which can be bought and sold. Pre-conditions⁵⁰ for the introduction of ITQS could include:

- existence of an effective single jurisdiction within which the fishery operates⁵¹;
- there are verifications of net financial benefits accruing to the fishery and fishers;
- availability of sufficient knowledge to allow determination of TAC;
- inclusion of all gear sectors into the scheme;
- equitable individual allocations can be determined;
- establishment of by-catch strategy;
- high grading must be manageable;
- monitoring and surveillance policies can control harvest; and
- there is broad industry support by all sectors of the fishery.

Each of these pre-conditions, some of which apply to (1) and (2), will be difficult for Sri Lanka to meet due to financial and resource problems. It important that effort and catch control limits be incorporated into the new Act and be implemented. However, planned growth of the MDB fleet is needed to ensure that Sri Lanka gains an equitable share of Indian Ocean tuna and billfish total allowable catch. IUU control requirements need to be introduced. However,

⁵⁰ Australian Fisheries Management Authority

⁵¹ The IOTA can set a quota for the Indian Ocean but Sri Lanka is one of many participants.

an effective fishery management and development plan for the MDB fishery⁵² would overcome some of these matters.

⁵² A draft was developed with stakeholders as in Taylor-Moore, N., 2002. Fisheries Management Specialist Reports CRMP (ADB TA No. 3477-SRI) and incorporated the need for expansion of the fishery to ensure a greater share of the Indian Ocean fisheries resources.

TABLE 21: Strengthening fisheries management control systems

Control mechanism	Application to fisheries management	Strengthening requirements
1. Natural controls		
<ul style="list-style-type: none"> Monsoon weather patterns 	During the monsoon fishing effort substantially reduced and fishing mortality lower providing protection for parts of the life cycle of fish.	NARA research on weather impacts on key species if applicable. Data on seasons.
2. Input controls		
<ul style="list-style-type: none"> Fishing Licence 	Conditions on access, species, gear specifies the fishing operation that can take place and means that agency has knowledge of who is in the fishery.	Conditions on Licence related to the fishery management plans.
<ul style="list-style-type: none"> Number and type of fishing gear 	Specifies the specifications of fishing gear such as mesh size, hook size and number help reduce by-catch, taking of fish based on sexual maturity, reducing ecological impacts and impacts on biodiversity. Also provides for equitable distribution of gear within fishery management areas.	NARA research on gear impacts.
<ul style="list-style-type: none"> Registration 	A fundamental mechanism as all fishing craft are recognized through boat ownership, identification and markings, home ports and community association.	Na
<ul style="list-style-type: none"> Boat configuration 	A technical control on the efficiency of the boat to impact fishing mortality.	Na
<ul style="list-style-type: none"> Seasonal closures 	A control needed to protect spawning periods of fish and impacts and protection of endangered species, for protection of other aquatic animals such as mammals and the needs of biodiversity.	Na
<ul style="list-style-type: none"> Controlled access 	Fishing craft limitations to control access to specifies areas, minimize gear and fishing operation conflicts ad/or limiting catching capability (effort control).	Change in regulation section of Act
<ul style="list-style-type: none"> Spatial closures 	A control that protects specified areas such as Fisheries Reserves or the various multi-use requirements of Marine Protected Areas or Marine Parks.	Na
<ul style="list-style-type: none"> Trip limits 	Number of days fished is a major indicator of potential catch of a fishing craft. A major form of effort control.	Change in regulation section of Act
3. Output controls		
<ul style="list-style-type: none"> Species and catch limits 	Established under a management plan based on biological, ecological, socio-economic, sustainability and conservation principles and data that is monitored during fishing operations. A formal but effective control mechanism requiring high levels of biological and stock assessment monitoring.	Change in Act
<ul style="list-style-type: none"> By-catch limits 	Fishing operations target specific species (either single or a suite of species) but fishing gear is often indiscriminate and other species need protection for biodiversity or endangered species (e.g. birds such as albatross from long lines or dolphins from nets).	Change in Act
4. Compliance controls		
<ul style="list-style-type: none"> Participatory co-management 	Voluntary arrangements for self compliance by fishing communities.	Change in Act
<ul style="list-style-type: none"> Logbooks 	A record of fishing operation of catch and effort data for species and spatial movement of boats.	Phased introduction
<ul style="list-style-type: none"> Reporting 	Information from logbooks and other data provide the management and research agencies information for effective management decision making.	Compliance Unit
<ul style="list-style-type: none"> Dockside/landing site monitoring 	Verification of catches, logbook data and processed form as a cross checking of actual fish catches, also includes biological sampling.	Compliance Unit
<ul style="list-style-type: none"> Port inspections 	Verification of catch and effort data, compliance with health standards (HACCP) and sea safety standards, input and output controls. Also to meet IUU Port State monitoring requirements of foreign vessel fish landings.	Compliance Unit

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Control mechanism	Application to fisheries management	Strengthening requirements
<ul style="list-style-type: none"> • VMS requirements 	<p>Vessel Monitoring System is electronic format for identifying position, movements, speed and direction of fishing vessels. It allows the agency to monitor the compliance of the vessel to the control mechanisms. Usually used for high valued, offshore and high seas fisheries. Expensive to maintain but effective.</p>	<p>Change in Act</p>
<ul style="list-style-type: none"> • Observer programs 	<p>Onboard observation of catch and effort, scientific data collection and compliance with fishery control mechanisms. Usually for high seas fisheries.</p>	<p>Change in Act</p>
<ul style="list-style-type: none"> • Sea patrols/inspections 	<p>Checking compliance with fishery management and safety regulations.</p>	<p>Arrangement with Coast Guard and Navy</p>
<ul style="list-style-type: none"> • Boarding at sea 	<p>On-board verification of compliance with management and safety regulations.</p>	<p>Arrangement with Coast Guard and Navy</p>
<ul style="list-style-type: none"> • Air surveillance 	<p>Verification of vessel positions as check on compliance with fishing zones.</p>	<p>Arrangement with Air Force or private contractor</p>

4.2.5.4 Strengthening of compliance system

Compliance is the process and actions of monitoring whether the fisheries sector complies with the management controls and enforcement for non-compliance. Compliance has two major approaches⁵³.

(1) *voluntary compliance* based on education, information and advice: involving stakeholders in compliance planning; involving stakeholders in developing legislative framework; co-management of fisheries; responsible compliance costs; and measuring effectiveness. Participatory management helps build greater understanding of management and compliance, develops partnerships between stakeholders in the fishery and management agencies, builds greater empowerment, ownership and acceptance of the outcomes of the decision making process; and the use of voluntary compliance. An example of a voluntary approach is the Fishery Code of Conduct for Responsible Fisheries (Table 23) which is more about sustainable fishing but includes voluntary compliance.

(2) *effective deterrence* based on effective monitoring and surveillance; risk management; targeting high risk offenders such as organized crime; improving the enforcement framework; effectively communicating enforcement outcomes; evaluation and review.

The proposed new Fisheries Act provides the basis for compliance activities:

- powers, duties and responsibilities of Sri Lanka and fisheries inspectors and other compliance officers such as coast guard, NAQDA extension officers⁵⁴, defence and police personnel;
- control measures for fishing operations;
- enforcement power of authorities officers;
- protects rights and interest of fisher and coastal communities; and
- provides due processes for non compliance.

Key international laws appropriate to support and demand compliance activities include⁵⁵:

- 1982 UN Convention for Law of the Sea;
- 1993 FAO Compliance Agreement;
- 1995 UN Fish Stock Agreement;
- 1995 FAO Code of Conduct for Responsible Fisheries;
- 1999 IPOA for sharks, seabirds and fishing capacity (IUU);
- 1995 Convention on Biodiversity; and
- 1975 Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

Strengthening requirements for compliance (Table 22) will enable MFAR to initiate change in fisheries management.

⁵³ Australian National Compliance Committee 2003. Australian Fisheries National Compliance Strategy 2003-2008.

⁵⁴ Extension Officers have no compliance powers under the NAQDA Act but would be involved in many aspects of voluntary compliance measures.

⁵⁵ Hettiarachchi, A. (2004) considers each in the context for Sri Lanka and states that political will of fishing States determine the effectiveness of these laws.

TABLE 22: Strengthening of compliance system

Nature of compliance	Effectiveness in fisheries management and detection of non compliance	Impacts on fisheries management	Strengthening requirements
1. Voluntary compliance			
Co-management	<p>Voluntary arrangements for self compliance by fishing communities.</p> <p>Highly effective if promoted carefully but must be built on awareness, communication campaigns and education.</p> <p>Relies on cooperation between Fisheries Inspectors and Fisheries Committees and Fisheries Cooperative Societies and Fisheries Management Authorities.</p>	<p>Higher level of compliance likely for inland fisheries and coastal fisheries as empowerment and participation increases.</p>	<p>Legislation to widen the meaning of Fishery Management Area and membership of Fisheries Committees.</p> <p>Training of Fisheries Inspectors and extension staff on fisheries management methodologies and control mechanisms, participatory approaches, effective communication, mediation etc.</p>
Logbooks	<p>A record of fishing operation of catch and effort data for species and spatial movement of boats. Can be simple for small and inland fisheries or complex for large scale or high value fisheries.</p> <p>Begin with voluntary approach and use the information to improve decision making and then system can become more formal under regulation for high value species and MDB fishery.</p> <p>Very effective for high valued fisheries.</p>	<p>Basic form of data collection. However, trust in the efficacy and veracity of the data will need to develop over time as fishers realize how important the information determined can improve their benefits from the fishery.</p> <p>Useful for specific research projects by NARA for catch per unit effort data.</p>	<p>Logbook data collection as part of regulation for fishing operations. Extension workshops with fishers on the use of logbooks.</p>
2. Deterrent compliance			
Reporting	<p>Effective for fisheries with basic reporting systems in place. Related to licensing and registration systems in place.</p>	<p>Improved information leading to changes in control measures and better understanding of the dynamics of the fisheries.</p>	<p>Training of Fisheries Inspectors and extension staff on fisheries management methodologies and control mechanisms, participatory approaches, effective communication, mediation etc.</p>
Dockside monitoring	<p>Very effective for determining real time information on the operations and landings of the MDB fishery.</p>	<p>Basic form of data collection. However, trust in the efficacy and veracity of the data will need to develop over time as fishers realize how important the information determined can improve their benefits from the fishery.</p> <p>Useful for specific research projects by NARA for catch per unit effort data.</p>	<p>Data supply as part of regulation for fishing operations.</p> <p>Extension workshops with fishers on the use of logbooks.</p>
Port inspections	<p>Very effective for the MDB fleet and for Port state landings required for IUU reporting for IOTC.</p>	<p>Improved information leading to changes in control measures and better understanding of the dynamics of the</p>	<p>Training of Fisheries Inspectors and extension staff on fisheries management methodologies and control mechanisms, participatory</p>

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Nature of compliance	Effectiveness in fisheries management and detection of non compliance	Impacts on fisheries management	Strengthening requirements
		fisheries. Useful for specific research projects by NARA for catch per unit effort data.	approaches, effective communication, mediation etc.
Shore based patrols	Very effective but relies on a mobile inspectorate but limited in data on fishing operations.	Improved information leading to changes in control measures and better understanding of the dynamics of the fisheries. Important form of on the ground data collection.	Data supply as part of regulation for fishing operations. Extension workshops with fishers on the use of logbooks. Mobile unit required with vehicles.
Sea patrols and inspections	Effective but costly. Verification of gear, catch, logbook completion, licences, foreign vessel activities and can arrest at sea.	Deterrent for illegal fishing.	Increase inspections powers.
Observers at sea	Effective for monitoring all at sea activities, verification of catch, discards, gear, processing and high grading.	Accurate data for management planning	Legislation to support observers.
VMS	Effective for determining real time monitoring the movement of vessels but more costly but catch/effort data could be downloaded.	Fishing patterns can be determined. No go zones protected.	Legislation required to support VMS required.
Aircraft	Effective for sighting over large areas for area violations but requires backup from on sea patrols.	Supports MPAs and other area closures and illegal fishing operations.	MOU required with Airforce.
Radar	Fuller coverage for close contacts and for set areas and provides a basis for interception activities.	Supports other methods of meeting the control measures through identification of potential threats to the resource or habitats.	Training of fisheries inspectors cooperate with the Airforce and use the information.
Satellite imagery	Full coverage of selected areas. High cost and requires linkage to other methods such as VMS.	Research projects by NARA for catch per unit effort data.	Resources for NARA.
Real time video	Full coverage of selected areas. Passive approach and relatively small cost for smaller areas.	Real time data collection but limited as a passive deterrent.	Training of inspectorate to use equipment and information gathered.
Coast/Reef Watch	Low cost and community involvement but needs to be socialised within the coastal communities for acceptance.	Basic form of data collection. However, trust in the efficacy and veracity of the data will need to develop over time as fishers realize how important the information determined can improve their benefits from the fishery.	Data collection as part of regulation for fishing operations. Extension workshops with fishers on the use of logbooks.

Source: Flewelling, P., (2002:31).

4.2.5.5 Fisheries Co-management

Fisheries co-management and community based management (CBM) are often limited to bottom up approaches and may be applicable for Fisheries Cooperative Society areas or for minor reservoir management. However, a different approach is needed for larger areas including defined coastal areas for management or for specific fisheries involving participation of a wider range of stakeholders.

Fisheries co-management can be defined as:

‘an institutional framework of co-management: relationships linking coastal communities, fishermen, government and other fishing sector stakeholders together in the fisheries management process to support intervention in the fishing sector to achieve specific objectives agreed by stakeholders.’⁵⁶

or to be

‘understood as a partnership approach where government and the fishery resource users share the responsibility and authority for the management of a fishery or fisheries in an area, based on collaboration between themselves and with other stakeholders’.⁵⁷

Fisheries co-management is therefore an integrated (i.e. top-down and bottom-up) approach to fisheries management by the people for the people where resources and risk management are shared by all participants as partners. If the key elements of the fisheries management planning system (Table 17) are implemented, fisheries co-management will be effective.

Co-management, with a strong emphasis on participatory processes, is based on twelve guiding principles (Appendix I Table 1). These twelve guiding principles are the basis of a framework for achieving participatory partnerships between coastal communities, fishers, government agencies and the private sector.

Because fisheries co-management is a joint decision making approach by fishing sector and other resources user stakeholders, many functions of fisheries management are improved, including the following:

- harvesting decisions enhanced by the information shared by both government scientific knowledge and fishers intimate understanding of the fishery;
- allocation decisions regarded by stakeholders as more equitable and acceptable;
- data collection as fishers understand the need for information for continuous improvement based on best available information;
- acceptance of fishery management plans by the fishing sector because of participation; and
- independence of fisher’s committees to represent their views, be listened to and accepted as genuine partners.

Although key stakeholders are involved in the process, fisheries managers and industry may not be committed to the process because of past experiences and the backgrounds of various participants.

⁵⁶ Taylor-Moore. N., (2001). A Framework for Participatory Coastal Fisheries Resource Management. ADB Project Loan No.1570/1571-INO Indonesia (Cofish).

⁵⁷ FAO/APFIC 2005 Mainstreaming fisheries co-management. APFIC Regional Workshop August Siem Reap, Cambodia. RAP Publication 2005/23 p.1

For example:

- government agencies hold the key information and may not be willing to share their knowledge: knowledge is power;
- participants, once part of the management process, may lose contact or remain aloof of their constituents;
- too many committees and decision making inertia;
- incompatible agendas based on beliefs, traditions and perceptions of stakeholder groups leading to breakdown of decision making agreements; and
- fisheries committees preferring to play politics and staying outside of the management process, to keep within the traditions of local decision-making.

The government must therefore establish commensurate legal rights authorities and devolve some of their rights. The process of establishing co-management requires changes in the MFAR involved as a partner building the capacity of DFAR to take over responsibility for undertaking co-management into the day-to-day management of marine fisheries is a key element of institutional strengthening of DFAR.

4.2.4.6 Voluntary fishery codes of conduct for responsible fisheries

A Voluntary Fishery Code of Conduct for Responsible Fisheries (VFCCR) is a public statement of the intention of fishers to accept responsibility for sustainable fisheries management. The code is a voluntary agreement that has no sanctions except social and moral obligation and is based on the FAO Code of Conduct for Responsible Fisheries (CCRF).

The VFCCR is very effective at the village level, landing site or reservoir level and under the auspices of a Fisheries Co-operative Society or Fisheries Committee. However, at a larger spatial scale or fishery level, the negotiation of the code will be more difficult but would act as a form of voluntary compliance. The development of these codes should be attempted for single species coastal fisheries such as shrimp, chank, ornamental fish and beche-de-mer and for the offshore/high seas tuna and billfish fishery.

An example of a VFCCR (Table 23) is provided to illustrate how comprehensive the VFCCR could be as a way of sustaining a fishery through co-management instead. Such a code would take the pressure off management agencies.

4.2.5.7 Proposed management of inland, coastal and offshore/high seas fisheries

Based on the sections above, frameworks for the management of each of inland, coastal and offshore / high seas fisheries are proposed (Table 24) based on: management area; ecosystem; fishery management plan; participation; monitoring, stock assessment and research; control measures and compliance.

TABLE 23: Voluntary fishery code of conduct for responsible fisheries

Component of code	Application to fisheries management
Background	<ul style="list-style-type: none"> • Fishery provides food, income and employment. • Fisheries by acting responsibly, improving technology, and accepting sustainability constraints on their fishing operations increase the welfare of their fishing communities. • A Code of Conduct, based on the FAO Code of Conduct for Responsible Fisheries, is a part of being responsible by setting voluntary guidelines and standards of behaviour therefore helping the GoSL meet its fisheries sector objectives and obligations of conservation, management, sustainable use and development of fisheries and aquatic resources. • Licensed fishers are encouraged to accept and apply the Code. • Fishers have been involved, through their representatives and industry meetings, in developing this Code.
The code promotes	<ul style="list-style-type: none"> • Ecologically sustainable development of fisheries and aquatic resources. • Adoption of world's best practice for the specific fishery by encouraging all fishing operations to conform with management plans and regulations. • Non extraction interactions with marine mammals, endangered or vulnerable species.
Nature and scope of the code	<ul style="list-style-type: none"> • Sets out voluntary guidelines and standards of behaviour and fishing practices for the fishery. • Code maybe incorporated within the conditions of a fishing operations licence on agreement. • The Code relates to all designated fishing waters, harbours, ports and landing sites.
Objectives of a code of conduct	<ul style="list-style-type: none"> • To develop a strategy for effective, professional and responsible fishing and fishing activities, according to the Act and management plan, taking into account international agreements and principles and international standards of behaviour for responsible practices as described with the FAO Code of Conduct for Responsible Fisheries including the FAO principles of the ecosystem approach for fisheries as well as all the relevant biological, technological, social, economic, environmental, cultural and commercial aspects of the fishery and the coastal communities. • Encourage collaboration between stakeholders and other persons having interest in the use, conservation and management of fish resources to abide by the FAO Code of Conduct for Responsible Fisheries. • Identify and promote new methods and technological advance relevant to the industry and all other objectives. • Provide standards of conduct for all stakeholders involved in the fishery. • Encourage release of species protected under any management plan or legislation. • Improve communications with stakeholders and local communities.
Management boundaries	<ul style="list-style-type: none"> • As designated under the management plan or regulations.
Conservation	<ul style="list-style-type: none"> • Promotion of international and national conventions and laws and agreements.
Data collection	<ul style="list-style-type: none"> • Supply all records as requested. • Supply data for research and development purposes. • Supply cost and earnings data for research and management purposes
Conduct of fishing operation	<ul style="list-style-type: none"> • According to maritime law. • Sustainable anchoring in fishing areas, harbours and ports to limit environmental damage. • Compliance with international regulations for the prevention of collisions at sea. • No dumping at sea. • No obstruction of other fishing craft fishing operations. • Retrieval of lost or abandoned fishing gear. • Marking of fishing gear. • Register and licence fishing boat. • Complying with controls measures.
Responsibilities of boat owners	<ul style="list-style-type: none"> • Captains fulfil duties as per conduct of fishing operation. • Train crew and expect good behaviour.

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Component of code	Application to fisheries management
	<ul style="list-style-type: none"> • Provision of fair remuneration. • Insurance of fishing craft as appropriate. • Adherence to maritime law.
Fish quality, handling and utilization	<ul style="list-style-type: none"> • Care of the catch. • Respect for Sri Lanka's name. • EU standard being met. • HACCP requirements observed. • Export laboratory testing when needed.
Gear technology	<ul style="list-style-type: none"> • Use of eco-friendly gear. • Cooperation in development/testing of new technology.
Employment and training	<ul style="list-style-type: none"> • Crew and captain to seek better training. • Career development opportunities. • Community regard for the fishing industry and specific fishery operations. • Safety training certificates.
Fishery management plan	<ul style="list-style-type: none"> • Participation in the development of the plan and associated regulations. • Acceptance and adherence to the plan and regulations.
Waste disposal	<ul style="list-style-type: none"> • No oil discharge. • Prevention of discharge of ballast waters within harbours or sensitive areas. • Removal of rubbish from fishing grounds, landing sites and wharves.

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TABLE 24: Proposed fisheries management for inland, coastal and offshore/high seas fisheries

Fisheries management component	Inland fisheries (Perennial reservoir)	Coastal fisheries	Offshore fisheries
Management area	One Fishery Management Area	Fishery Management Area is determined by the type of fisheries and other criteria. Each FMA has a Fisheries Management Authority.	Fishery Management Area is the EEZ but not including the continental shelf. This means that issues specific to IOTC and to Sri Lanka waters fisheries can be highlighted.
Management plan	One Fishery Management Plan	National Management Plan consisting of pelagic, demersal, and small local fisheries such as local, beche-de-mer, chank, shrimp and ornamental fish. National Management Plan implemented at district level through local fisheries management authorities if appropriate	National Management Plan for a limited entry fishery based on MDB boat numbers registered at end of 2010 with new entrants meeting criteria for high seas fishery.
Participation	Fisheries Committees with all Fisheries Cooperative Societies plus other stakeholders under the one Fisheries Management Area .	Fishers and other fisheries stakeholders as a member of a fisheries committee. District Fisheries Advisory Committee made up of representatives of Fisheries committees and other fishery sector stakeholders under the auspices of DFAR. A National Management Advisory Committee that provides recommendations to Minister and DFAR with representatives of coastal fisheries.	District MDB Fishery Committees made up of representatives from the District fleet and other key stakeholders such as port/harbour processors, traders etc to help implement national plan. A National Management Advisory Committee that provides recommendations to Minister and DFAR with representatives of district MDB committees.
Monitoring and stock assessment	Catch and effort data and fishing operations but doubt about usefulness of a stock assessment due to stocking.	Monitoring of catch and effort data, fishing operations, habitat and environment. Stock assessments for specific fisheries e.g. beche-de-mer, chank, lobster and shrimp and ornamental, as per CIDA funded FAO project and others.	NARA monitoring of all catch and effort data for building up stock assessment requirements for IOTC and for national fleet development and management, regular cost and earnings studies.
Control measures	As agreed by the Fisheries Committee and includes limits on fishers and gear and closures. Registration and licence	Suggested control measures options include: <ul style="list-style-type: none"> • Registration - marking of boats and/or registration of fishers; • Licensing – licensing access and harvest (e.g. area, gear, species, landing at 	Suggested control measure options include: <ul style="list-style-type: none"> • Registration - marking of boats and/or registration of fishers; • Licensing – licensing access and harvest (e.g. area, gear, species, landing at harbours), different fees for different activities;

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Fisheries management component	Inland fisheries (Perennial reservoir)	Coastal fisheries	Offshore fisheries
		<p>harbours), different fees for different activities</p> <ul style="list-style-type: none"> • Input controls – numbers and type of gear used, number and type of boats, fish size, mesh size, fishing zones etc ; • Marine protected areas - area closures, seasonal closures; • reporting requirements –data collection methods; • Codes of conduct - agreement by fishers to do the right thing with no sanctions except social and moral obligation; • MOUs between fishers and other stakeholders. 	<ul style="list-style-type: none"> • Input and effort controls – numbers and type of gear used, number and type of boats, fish size, mesh size, fishing zones; • Output controls - quota for boats, areas; species quota, limited species for each type of gear; • Reporting requirements – logbooks, data collection methods; • Codes of conduct - agreement by fishers to do the right thing with no sanctions except social and moral obligation; and • MOUs between fishers and other stakeholders.
Compliance	By the Fisheries Committee and inspection staff of DFAR and co-management through FISHERIES Committees and Fisheries Cooperative Societies.	<ul style="list-style-type: none"> • Co-management approach; • Reporting; • Dockside/landing site monitoring; and • Port inspections. 	<p>Depending on the maturity of the fishery and IOTC requirements:</p> <ul style="list-style-type: none"> • Logbooks; • Reporting; • Dockside/landing site monitoring; • Port inspections; • Observer programs; • Sea patrols and inspections; • Boarding at sea; • Air surveillance; and • VMS.
Implementation timelines	<p>Year 1. Separation of extension from compliance functions. Compliance staff empowered under Fisheries Act.</p> <p>Compliance staff trained in inspection duties. Extension officers trained in participatory co-management.</p> <p>Year 10. FMA & FCS in all perennial tanks.</p>	<p>Year 1 Separation of extension from compliance functions. Compliance staff empowered under Fisheries Act. Compliance staff trained in inspection duties. Extension officers trained in participatory co-management.</p> <p>Year 3 Beche-de-mer, chank, shrimp, ornamental fisheries & lobster management plan in place.</p> <p>Year 10. FMA & FCS in all key fisheries. All districts with District Fisheries Committees and management plans.</p>	<p>Year 1 Compliance Unit established. IOTC Registry. MoUs with Coastguard, Navy and Air force in place.</p> <p>Year 2 National Management Advisory Committee Developed, with fishers (and other stakeholders) from District Fisheries Committees, together with implementing & Research organisations. Draft national management plan for the fishery developed. Inspection benchmarks and designated ports set.</p> <p>Year 5 Fisheries monitoring centre established (VMS). Quota system established to meet IOTC requirements if necessary.</p> <p>Year 10.</p>

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Fisheries management component	Inland fisheries (Perennial reservoir)	Coastal fisheries	Offshore fisheries
			All MDBs with VMS.
Assumptions	<ul style="list-style-type: none"> • Political support for implementing participatory co management; • MFAR has technical knowledge to develop policy commensurate to international agreements and principles and international standards of behaviour for responsible fishing practices; • Consultation processes are adequately undertaken in the design of management systems; • Extension support available from NARA, DFAR & NAQDA; • Legislation contains the appropriate instruments to introduce fisheries management; • DFAR and FCS have the capacity to implement (personnel, equipment and data systems) MCS; and • Fishery industry supportive of change. 	<ul style="list-style-type: none"> • Political support for implementing participatory co management; • MFAR has technical knowledge to develop policy commensurate to international agreements and principles and international standards of behaviour for responsible fishing practices; • Consultation processes are adequately undertaken in the design of management systems; • Extension support available from NARA & DFAR; • Legislation contains the appropriate instruments to introduce fisheries management; • DFAR and FCS have the capacity to implement (personnel, equipment and data systems) fishery management systems; and • Fishery industry supportive of change. 	<ul style="list-style-type: none"> • Political support for implementing a management system; • MFAR has technical knowledge to develop policy commensurate to international agreements and principles and international standards of behaviour for responsible fishing practices; • Consultation processes are adequately undertaken in the design of management systems; • Consultation processes are adequately undertaken to include scientific and technical advice; • Legislation contains the appropriate instruments to introduce fisheries management; • DFAR has the capacity to implement (personnel, equipment and data systems) fishery management systems; • Fishery industry supportive of change; • IOTC recommends quotas or other management measures such as boat limits, VMS monitoring & IUU detection.

4.2.6 Strengthening of fisheries legislation

The implementation of the MFAR Ten Year Development Policy Framework of the Fisheries and Aquatic Resources Sector 2007-2016 through the proposed MFAR Log Frame⁵⁸ requires a review of the existing laws and regulations that apply to the fisheries sector and changes needed for implementation of the policy framework.

The key MFAR legislation reviewed included:

- *Fisheries and Aquatic Resources Act No. 2 of 1996 and Amendment of 2004*; and
- *2006 Draft Fisheries Bill*.

Regulations, considered in brief within the context of the above provisions, include:

- *Fisheries (Regulation of Foreign Fishing Boats) Act No.59 of 1979*;
- *Fishing Operation Regulations, 1996*;
- *Landing of Fish Regulations, 1997*;
- *Landing of Fish (Species of Shark and Skates) Regulations, 2001*;
- *Monofilament Nets Prohibition Regulations, 2006*;
- *Percentage of Local fishing Boat Registration Fees (payable to the Provincial Fund) Regulations, 1998*;
- *Fisheries (Information) Regulations, 1997*;
- *Handling and Distribution of Fish Regulations, 1997 and Amendment 1999*;
- *Fish Processing Establishment Regulations, 1997*;
- *Fish Products (Export) Regulations, 1998 and Amendment 2000*;
- *Payment of Reward Regulations, 2006*;
- *Chank Fishery Management and Export Regulations, 2001*;
- *Sea Shells Fisheries Management and Export Regulations 2001*;
- *Export and Import of Live Fish Regulations, 1998 and Amendment of 1998*;
- *Lobster Fisheries Management Regulations 2000*;
- *Old Dutch Canal and Mundal Lagoon Fishing Regulations, 1996*;
- *Fisheries Management (Matara District, Thotamuna, Ginigasmulla) Regulations of 2000*;
- *Chilaw Lagoon Fisheries Regulations, 1996*;
- *Negombo Lagoon Fishery Management Area Regulations, 1998*;
- *Rekawa Lagoon Fisheries Management Area Regulations, 1998*;
- *Fisheries Management (Batticaloa Lagoon) Regulations 2001*;
- *Inland Fisheries Management Regulations, 1996*; and
- *Udukiriwili Reservoir Fisheries Management Area Regulations of 2001*.

4.2.6.1 Weaknesses of existing and proposed fisheries legislation

The *Fisheries and Aquatic Resources Act No. 2 of 1996 and Amendment No. 4 of 2004* (F&ARA) and related regulations has been thoroughly reviewed under ADB TA No. 3477-SRI⁵⁹ and it is not the intention to repeat that analysis. However, there are key shortcomings of both Acts that require highlighting due to the implementation of the MFAR Ten Year Development Policy Framework through the proposed MFAR Log Frame.

⁵⁸ Objective 1, Result 2, Activity 3: Upgrade existing legislation to take account of new management strategies.

⁵⁹ Judith Swan (2002) International Legal Specialist: Final Specialist Report p85-165.

These shortcomings lack reference to resource sustainability and fishery management principles and objectives, best practice resource management planning including various forms of participatory co-management, input and output controls, compliance controls, foreign fishing controls, international fisheries obligations, registration and licensing, and limiting powers to determine regulations (Appendix I Table 2 and Table 3). The aim of this section is to consider these shortcomings based on achieving international best practice.

In the analysis of the F&ARA and shortcomings note that not all provisions of the F&ARA have been considered as these are not critical to the achievement of the MFAR long term policy or as indicated within the MFAR Log Frame.

The review of fisheries legislation found that F&ARA has outdated provisions based on a limited (no effort limitations) regulatory (top-down) approach to fisheries management that creates an open access approach to fisheries management of the marine fisheries. The only form of fisheries management involving stakeholders is based on a Fisheries Committee approach within designated Fisheries Management Areas based on no objective assessment criteria. Fisheries Committees exclude membership of non-fishermen stakeholders. Some examples of Fisheries Management Area regulations exist. However, powers to undertake creative approaches to the management of offshore, coastal and inland fisheries are non-existent. For example, no provisions support co-management in any form. The provision of powers for Fisheries Inspectors are limited compared to the international best practice compliance requirements. Other weaknesses include meeting international obligations such as the agreements under IOTC, IUU agreements and eco-labelling.

Reform of the F&ARA is essential to enable the MFAR Ten Year Development Policy Framework to be achieved. The imperative is to clearly establish the objectives of a new Act and give powers to:

- implement Sri Lanka's international treaty and related obligations;
- ensure sustainable management through input and output controls;
- allow for non legislative approaches such as a Voluntary Code of Conduct for Responsible Fishers based on the FAO Code;
- enable Co-management functions;
- clarify the functions of MFAR, DFAR, NARA, NAQDA, FC/FMA;
- remove obstacles that prevent stakeholder organizations from functioning;
- strengthen compliance functions; and
- provide the basis to develop and implement fishery management and development plans.

However, a draft Fisheries and Aquatic Resources Bill (2001 Bill) was prepared by the Legal Draftsman to repeal the Fisheries and Aquatic Resources Act No.2 of 1996 and the Regulation of Foreign Fishing Boats Act No.59 of 1996 in response to the above shortcomings. Also, the CRMP ADB TA No. 3477-SRI project through the International Legal Specialist provided a draft Bill (2003 Bill) that incorporated international best practice for the management and conservation of fish and aquatic resources. The current draft Bill (2006 Bill) is based on the 2001 Bill incorporating some of the aspects of the 2003 Bill.

An analysis of whether the 2006 Bill overcomes the F&ARA shortcomings is provided in Appendix I Table 2. Note that not all provisions of the F&ARA, viewed in the context of the 2006 Bill and the 2003 Bill, have been considered as these are not critical to the achievement of the MFAR long term policy or as indicated within the MFAR Log Frame.

Some of the key provisions⁶⁰ of the 2003 Bill:

- (1) A framework for a clear, transparent licensing and registration system to ensure that the fisheries resources will continue to yield maximum benefits to the people of Sri Lanka
- (2) Institutional reforms to support the management and development functions and enable participatory management
- (3) Provides a framework for fishery management and development plans
- (4) Meets Sri Lanka's international obligations to provide a clear basis for foreign fishing and related activities in Sri Lanka waters
- (5) Clear powers of Officers and Inspectors for monitoring, control and surveillance (MCS) purposes including use of cameras, position fixing instruments and other up-to-date technology
- (6) Establishment of committees for participatory fisheries management. Committees may be established at village landing sites, anchorages and harbours, local area, district and national levels in accordance with this Bill, for the purpose of providing for participatory fisheries management.

These committees may take the form of:

- Fisheries Committees established at anchorages, harbours, village and local area levels, comprised of fishers, boat owners and/or skippers
- Fisheries Advisory Committees, established at the district and/or national level, comprised of fishers and other stakeholders in such a manner as to ensure that the objectives of participatory management are attained.

However, the 2001 Bill is strong on (1) but omits (2) to (6) above. As a result the 2006 Bill uses some of the provisions from the 2003 Bill to overcome these shortcomings. As shown in Appendix I Table 2, the key area still not within the 2006 Bill relates to the framework for international best practice for fisheries management. The MFAR Log Frame for the fisheries component identifies the need for 'upgrading existing legislation to take account of new management strategies' such as 'management plans for commercially important fisheries (inland, coastal, and offshore / high seas)' and 'incorporating international agreements'.

Therefore the 2006 Bill requires an additional set of fisheries conservation, management and development provisions as put forward in the 2003 Bill. This would include the following additional provisions:

- management objectives and principles;
- conservation and management measures;
- procedures for conservation and management;
- designated fisheries;
- strengthening control measures;
- strengthening compliance systems; and
- Fishery Management and Development Plan.

The revised 2006 Bill has outdated provisions that still provide a regulatory approach to fisheries management. The key findings of the analysis mean that:

⁶⁰Based on personal communication with Leslie Joseph and a review of the CRMP 2003 Bill under ADB TA No. 3477-SRI.

- the F&ARA still allows an open access approach to fisheries management of the marine fisheries of Sri Lanka based only on top down regulations with no effort or catch control limit provisions for coastal and offshore fisheries⁶¹ and does not fully account for the requirements of the precautionary approach (Box 15) and FAO Code of Conduct for Responsible Fisheries (Table 24);
- the fisheries management approach is very limited and still based on a Fisheries Committee approach within designated Fisheries Management Areas with no objective assessment criteria. Fisheries Committees still exclude membership of non-fishermen or stakeholders, hence co-management in any form is not supported;
- provisions for Fishery Management and Development Plans absent; and
- compliance provisions have improved particularly with respect to international obligations but VMS omitted.

4.2.6.2 Strengthening of proposed fisheries legislation

Therefore, key areas that need consideration for improving the 2006 Bill were noted as a result of the review of current and proposed legislative provisions (Table 25), these include:

1. Lack of conservation and management objectives of the Bill;
2. Powers of Minister and Director General;
3. Functions of the Fisheries and Aquatic Resources Advisory Council;
4. Change of licensing of fishing operations to fisheries management functions;
5. Limited concept of Fisheries Management Areas;
6. Narrow membership of Fisheries Committees;
7. Limits of open and closed seasons as input controls;
8. Tightening of provision for research or scientific purposes;
9. Narrow functions of Fisheries Reserves;
10. Expansion and definition of powers of authorized Officers to meet fisheries management requirements including international obligations;
11. Expansion of offences and penalties to meet fisheries management requirements; and
12. Regulations to meet fisheries management requirements.

The justification for these changes is also provided in Table 25. Given the nature of the direction and actions required under the MFAR Ten Year Development Policy, any new Act could be called *Fisheries Management Act No. of* and would give a clear message of the intent of the new Act and provide support for the institutional strengthening of MFAR agencies.

⁶¹ The provisions should allow for expansion of the fleet to meet the demands for tuna and billfish harvest within the Indian Ocean and to limit catch by quota or boat numbers if needed as put forward in the CRMP 2002 Draft Management Plan for the MDB Fishery.

TABLE 25: Justification of improvements to the proposed 2006 Fisheries Bill

Suggested Improvements⁶² to 2006 Fisheries Bill	Justification
PART 1 Administration	
<p>1. Lack of objectives of the Bill Include an objective of the Act that relates to:</p> <ul style="list-style-type: none"> • sustainability of fisheries and aquatic resources; and • International conservation and management measures. 	<p>By stating clear objectives the Bill establishes the mandate for action that can be accountable through assessment and evaluation. (Refer 2003 Bill)</p> <p>For example: The object of the Act is to provide for the sustainable use, conservation, co-management and development of fisheries and aquatic resources for the benefit of the people of Sri Lanka. Sustainable use meets international best practice. This provides the framework for more specific objectives.</p>
<p>2. Powers of the Minister and Director General: Include powers to clarify limitations and areas where power is vested. Provide guidance to the in terms of conservation and sustainable use of fisheries and aquatic resources.</p>	<p>By specifying the powers of the Minister it clarifies what roles and responsibilities he has as the chief decision maker for the management of fisheries and aquatic resources as opposed to that of the Director General. For example: for international fisheries agreements the Minister may enter into fisheries access agreement whereas the Director General may implement these agreements.</p> <p>Statement of functions and duties clarifies the actions of the Director General. For example new requirements such as:</p> <ul style="list-style-type: none"> • Formulation of policies and strategies • International conservation and management measures • Ensure that fisheries management processes occur.
<p>3. Functions of the Fisheries and Aquatic Resources Advisory Council Reduce size of FARAC with independent chair and focus on policy such as the MFAR ten year development policy. Other stakeholders may be included for more effective advice (e.g. MDB society). A formal selection process should be established seeking nominations from non MFAR stakeholder groups.</p>	<p>As an advisory body the FARAC cannot and should not initiate any action. A role can be to highlight the interactions of other Acts affecting the administration of F&ARA. For example: The proposed provisions of the Coast Conservation and Coastal Resource Management 2006 Bill as it affects the management of coastal fisheries through interaction with SAM processes Remove power to cause preparation of fishery management plans as this is a function of the Minister and the Director General. Policy and planning issues affecting proper management of fishery and aquatic resources are the key advice.</p>
PART II Licensing of fishing operations	
<p>4. Change of Licensing of fishing operations to fisheries management functions This provision is the only part of the F&ARA related to a licence and is negative i.e. ..."no person shall. "</p> <ul style="list-style-type: none"> • Best practice for licence provisions is to specify compliance with licence terms and conditions rather than just through regulations and to include illegal fishing and other unlicensed activities. • Power to limit numbers of marine fishing licences necessary for best practice management. 	<p>Under circumstances where output controls are not feasible except in one or two cases (e.g. tuna and lobster) effort controls are the best practice mechanisms available.</p> <ul style="list-style-type: none"> • Licensing is the key to effort control; • Conditions of use must be species and management focused; • limitations on number within a fishery management area and fishery management plan important; • Renewal should not be subject to sustainability criteria based on view of authorized person; and • Licence conditions must be consistent with management plan provisions, conservation and management

⁶² Based on MFAR Log Frame requirements and the CRMP (ADB TA No. 3477-SRI) International Legal Specialist: Final Specialist Report and Fisheries Management Specialist Reports.

Suggested Improvements⁶² to 2006 Fisheries Bill	Justification
<ul style="list-style-type: none"> • The concept of sustainability and the precautionary principle should be in the objectives of the Act. • All fishing boats operating in Sri Lanka waters (e.g. tuna fishery) should come under same rules – inconsistent policy and could lead to political interference. • Transferability of FLs is a key aspect of fisheries development and wealth generation – care should be taken to ensure that windfall gains are minimal. • Linkage to objectives of the Act. 	<p>measures and Sri Lanka international obligations.</p>
PART IV Protection and Conservation of fish and other aquatic resources	
<p>5. Limited concept of Fisheries Management Areas (FMA) Objectives for declaration of FMA need to be specified.</p> <p>Limits fisheries management to areas not species or boat/gear approaches. Add to provision 33(1)(a) to include after land “and or species or fishing operations found within the prescribed area”. Or an alternative is to replace “fishery management area” with “fishery management area or fishery”.</p> <p>A FMA needs to be able to accommodate:</p> <ul style="list-style-type: none"> • High seas • Offshore; • Continental shelf; • Bays, inlets • Lagoons and estuaries; • Inland waters; • Districts and coastal GN areas; • Fish species; • Fishing gear; and • SAM and APC sites. 	<p>A major shortcoming of the Bill.</p> <ul style="list-style-type: none"> • An FMA is therefore the basic unit of management and relates to Sri Lanka waters and/or adjacent land; • As it precludes the designation of a fishery or fisheries as defined in the interpretation provision the application of fishery management and development plans not possible; and • Fisheries management relies only on vague provisions such as section 33(2) make recommendations to Minister or 34(2) formulate a fisheries programme. <p>In summary a section on fisheries management is required with provisions for:</p> <ul style="list-style-type: none"> • Objectives and principles; • Conservation and management measures and procedures; • Designated fisheries; • Fishery management and development plans; • Fisheries management areas; • Fisheries reserves; and • Information requirements for fisheries management.
<p>6. Narrow membership of Fisheries Committees Very restricted use of a Fisheries Committee – only relates to area but under a world's best practice fisheries management regime species or boat type would need to be managed. As membership is for fishers only, there needs to be a broadening of membership to allow for stakeholder involvement in fisheries management. Relationship between functions of fisheries cooperative societies and that of fisheries committees. Participatory processes need to be identified and agreed.</p>	<p>A major shortcoming of the Bill:</p> <ul style="list-style-type: none"> • Coastal communities must be participants in co-management to ensure ownership and empowerment (i.e. participatory co-management); and • The current top-down (regulatory) approach provides no incentive for fisher engagement in conservation of coastal fisheries resources.
<p>7. Limits of open and closed seasons as input and output controls Open and closed season are one of many management tools used for protection of fish stocks under the current Act. Effective management uses a holistic approach under a fishery management plan.</p>	<p>Consultation processes undefined. No reference to management plans No reference to complementary effort controls. The following may be used, days at sea, technical regulation such as gear and species specifications, max and min size limits, catch limits and size and number of vessels.</p>

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Suggested Improvements⁶² to 2006 Fisheries Bill	Justification
8. Tightening of provision for research or scientific purposes Ensure that permit conditions are in accord with fisheries management plans and international accepted requirements for research plans and information sharing.	Unless controlled, conservation and protection maybe jeopardized (as scientific whaling by Japan)
PART V Conservation	
9. Narrow functions of Fisheries Reserves (FR) Specifically F&ARA should broaden functions of FR to include management of multiple-use and protection including endangered and vulnerable flora and fauna. A framework or process for creating fisheries management plans should be added to F&ARA rather than rely on the Fisheries and Aquatic Resources Advisory Council to cause management plans to be prepared. A plan for the activities within a FR that meets international requirements for exemptions needed. CCD permit system and the FR prohibitions not clear. Permit for <i>bona fide</i> research may be given to recognized research institutions such as NARA and Universities and registered consultation all of which undertake activities relevant to the sustainability of fisheries and aquatic resources and their management.	Best practice fisheries legislation includes a PART for Fisheries Conservation, Management and Development and includes principles for fisheries management to support international obligations and fisheries management plans. A broader application of Fisheries Reserves enables conservation (multiple use of fisheries and aquatic resources) and protection of endangered and vulnerable fish and aquatic species. Another form of Conservation Area could be used which allows for multiple-use (e.g. GBRMP).
PART VIII Authorised officers and their powers	
10. Expansion of Powers of Authorised Officers to meet fisheries management requirements Power to regulate for provision and for operation of a VMS for electronic gathering and storing of information on vessel and fishing activities and outputs and management of VMS and monitoring of control measures.	Commitments for IOTC will eventually require the use of VMS on the offshore fishing fleet:
PART IX Offences and penalties	
11. Expansion of Offences and Penalties to meet fisheries management requirements Powers relating to potential offences under a fisheries management plan.	Fisheries management and development plans have obligations that must be met and offences and penalties need to be specified.
PART X General	
12. Regulations to meet fisheries management requirements Areas for future regulation suggested by the MFAR Log Frame may include: <ul style="list-style-type: none"> • determination of allowable level of catch, levels of sustainable catch, fishing quotas, additional input and output controls; • fishery management and development plans; and • international obligations relating to illegal, unregulated and unreported fishing within IOTC area. 	Fisheries management and development plans are generally statutory therefore have obligations that must be met and offences and penalties need to be specified.
Add new definitions as required.	

4.2.7 Responsibilities/obligations of support agencies /institutions

Table 26 identifies the principal tasks required to support the design and implementation of fisheries management systems in inland, coastal and high seas fisheries. Critical issues are as follows:

(1) MFAR.: Distinction should be made between policy design (MFAR) and implementation (DFAR and NAQDA), with stronger emphasis on technical support within MFAR in designing management systems and monitoring developments in the fishery sector as well as in international rules and codes of conduct.

The design process will include appropriate consultative processes, specification of control measures to be used, and monitoring and compliance systems to be applied.

In designing management systems, MFAR will require input from an international fisheries management specialist, and from a national economist, biologist and legal specialist.

- **The fisheries management specialist** will have to have knowledge of input and output control systems, management data and information requirements and use, management approaches and measures as well as co-management.
- **The economist** will be required to determine the maximum economic yield for the fishery and the economic consequences of any management action for the fishery and to guide the fisheries towards participating in achieving the goals determined by the macro-economic policies.
- **The biologist** will provide ongoing support in collecting the data required to implement management plans, usually based on monitoring stocks or fish communities, and the fisheries and assist in policy decision making and act in liaison with other support institutions such as NARA.
- **The legal officer** will prepare adjustments to draft Bills and Statutory instruments relating to fisheries and CZ management and other MFAR activities.

MFAR should also coordinate the discussions on fisheries management plans with all stakeholders and should be responsible for providing advice to Ministers on proposed changes to legislation if required.

Based on the above, MFAR tasks and objectives should be adjusted accordingly.

(2) DFAR.: The following specific tasks would be identified:

- provision of ongoing technical advice to MFAR on the management and compliance implications for policy design;
- develop, in consultation with MFAR and other stakeholders, appropriate fishery management plans;
- promote and implement co-management;
- to implement ongoing decisions that support the defined fisheries management system;
- to implement monitoring systems including fishery statistics and recording of other data sets that support compliance;
- to implement a compliance system, with a dedicated compliance unit; and

- to implement extension support for Fisheries Committees, i.e. improving the understanding and awareness of fishing communities on fisheries management including licensing and registration.

It is noted (Table 2) that there is a pool of 167 fishery inspectors, together with 177 State management assistants and 138 fishery resource management assistants. This provides 482 officers that can be deployed for inspection, extension and data collection.

BOX 18: Fisheries Inspector compliance duties

<p>Fisheries Inspector – Fisheries co-management</p> <ul style="list-style-type: none"> • Liaison officer of DFAR Compliance Unit with fishers, Fisheries Committees and Fisheries Cooperative Societies including attendance of their meetings; • Work with DFAR fisheries managers in the development of fishery management and development plans and attend fisheries management planning meetings for compliance input; • Provide policy advice on compliance issues to DFAR; • Assist co-management groups to develop fishery codes of conduct and other voluntary compliance approaches; • Assist fishers in registration and licensing requirements/procedures and form filling; and • Maintain records of activity and alleged offences. <p>Fisheries Inspector – Compliance</p> <ul style="list-style-type: none"> • Conduct coastal and shore patrols to collect and monitor fishing activities • Conduct inspections of fishing boats and catches for compliance with control measures such as mesh sizes, banned gear etc; • Take appropriate action and maintain records of violations – warnings with explanation (verbal and written), administrative penalties, detention, impounding, arrest and seizure of equipment, court action and calling for Special Enforcement Unit support; • Explain to fishers the concept of compliance as a major contribution to fisheries management; • Explain and socialize new legislation and the management plans; and • Maintain records of activity and alleged offences. <p>Fisheries Inspector – Special Enforcement Unit (SEU)</p> <ul style="list-style-type: none"> • Rapid response to significant non-compliance occurrences throughout Sri Lanka; • Carry out surveillance over long periods of time; • Liaise with police, defence and security personnel; • Carry out joint operations with other maritime enforcement officials; • Act as security for other compliance official working on sensitive operations; • Conduct thorough inspections on serious offences; • Conduct port and at sea inspections for Sri Lanka vessels inside/outside EEZ and for foreign vessels within the EEZ; and • Maintain records of activity and alleged offences. <p>Fisheries Inspector – Radio</p> <ul style="list-style-type: none"> • Set up radio stations for networking with fishers; • Act as sea safety communication and facilitate air sea rescues; • Operate, maintain and repair HF and VHF radio stations and equipment for 24/7 monitoring and service; • Provide compliance information to the Compliance Unit; • Remain current with communications technology; • Provide information sharing and services to partner agencies within the ministry and other agencies as required; and • Maintain records of accidents, loss of life etc.
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Source: Extracted from Flewelling, P., (2002)

The following are recommended:

A. Compliance deployment numbers:

1. **Port fisheries inspectors - compliance.** There will be expanding demands on fisheries inspectors. The volume of landings into the 14 ports may require more inspectors than are currently deployed. A realistic assumption (without knowledge of inspection benchmarks and current landing data), is that 2 inspectors may be required per 8 hour shift per port in order to (1) verify

landings and log books from the MDB fleet, (2) collate the log book information, and (3) check fishing gear. The numbers will vary according to the demands in each fishing port. This would mean approximately 84 port inspectors. This equates to 6 port inspectors per district (14 districts).

2. **Coastal fishery inspectors – compliance & liaison.** The current coastal inspector deployment rational is 1 inspector per 8 km of coastline. This would entail around 212 fishery inspectors to cover 964 landing sites. This equates to approximately 15 Coastal fishery inspectors per district.
3. **Inland fishery inspectors.** There needs to be a dedicated inland fisheries inspectorate based within DFAR Compliance Unit, as opposed to the NAQDA extension service covering fisheries compliance. This has to reflect the fairly substantive abuse occurring in some reservoirs. This assumes 2 inland inspectors per district (28).
4. The **Special Enforcement Unit** would be deployed out of DFAR Compliance Unit.
5. The **Radio officers** (37) would be deployed out of the Fishery Monitoring Centre. This would mean that (1) the existing cadre of fisheries inspectors needs to be expanded, and (2) in order to fulfil their duties as regulators, the inspectors will be unable to undertake other duties.
6. **Fishery management data collectors.** There are 28 data collectors (2 per district) assigned to these tasks. They presently form part of 167 fishery inspectors. These activities should not be confused with compliance activities.
7. **Extension officer.** Fisheries inspectors currently fulfil this duty. There is a need for dedicated support for extension and participatory co-management (as well as social welfare) activities. This would require 3 personnel per district
8. **HQ Extension.** To coordinate the extension activities at district level and to provide policy advice (2 officers)
9. **HQ fisheries management.** To be responsible for specific fisheries (offshore and coastal fisheries (beche-de-mer, lobster, chank and ornamental fish) in the first five years; and the coordination of fishery management plans, in consultation with fishery management personnel in the districts (6 officers).

B. Coordination

HQ Compliance Unit within DFAR: There needs to be a Compliance Unit in HQ that has a coordinating role for fisheries inspectors in the AD offices. The unit will identify inspection targets, coordinate with partner organisations (e.g. Coastguard), set and revise Standard Operating Procedures. The Radio officers (38) will form part of this group, with a stronger emphasis on position reporting that will facilitate the inspection activities on land and at sea.

HQ Fisheries Management Unit within DFAR: This Unit will set the framework for fishery management plans and management controls, and will take responsibility for the development of the management plan for the offshore and high seas fishery, with inputs from the fisheries management unit within the AD office. The Fisheries Management Unit will be responsible for data collection and supporting better fisheries co-management.

AD Office: This office has two units, compliance and fisheries management. The HR component will be managed by each AD, but the officers will report to their counter parts at HQ for operational instructions⁶³.

⁶³ This proposal emanates from Military lines of instruction. It is used, successfully, in two European Compliance agencies. The Scottish and Irish fisheries protection agencies.

(3) NAQDA: The distinction between extension and compliance needs to be addressed. It is the consultants' view that regulations and compliance issues in inland fisheries should be addressed only by MFAR and DFAR. NAQDA is best suited as organisation to provide extension services. Equally, because of the common implementation requirements in both marine and inland fisheries, it would be best suited for this to fall under the responsibility of DFAR Compliance Unit but managed under inland ADs. If this were politically unacceptable, the above tasks would have to be specified as NAQDA activities.

(4) FCS: The ambit of these organisations should be extended to undertake participatory co management activities in inland and (some) coastal fisheries.

(5) NARA: The organisation's role is to act as *service provider* to MFAR and Fisheries Committees. This will require extension services to provide ongoing scientific, economic and technical input for fisheries management.

(6) NIFNE: The organisation should initiate training to improve the capacity of the entire above stakeholder in order to strengthen the fisheries management system.

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TABLE 26: Institutional responsibilities and obligations in fisheries management

Institution	Tasks	Changes required to support activities
1. Fisheries policy		
Ministry of Fisheries and Aquatic Resources (MFAR)	<ul style="list-style-type: none"> Analyse, consult and design fishery management systems applied to Sri Lankan fisheries in consultation with DFAR/NARA and fishery sector; Coordination, facilitation, monitoring and supervision of the functioning of the agencies and institutions to support management systems; and Provide advice to the Minister responsible for fisheries and coastal resources under the <i>Fisheries and Aquatic Resources Act No.2 of 1996 and Amendment No.4 of 2004</i>. 	<ul style="list-style-type: none"> Strengthen administrative structure to incorporate policy advice (TA through international fisheries management expert, economist, legal officer & biologist); Coordination of workshops on management systems; Attending international forums; and Provide a policy specialist (Donor funded) to support development in a management systems for th MDB fishery and promotion of participatory management processes.
2. Implementation		
Department of Fisheries and Aquatic Resources (DFAR)	<ul style="list-style-type: none"> Provide technical support in the development of fisheries policy; Legislative development, licensing and registration of fishing operations; Implement the fishery management systems in consultation with all stakeholders of the fishery sector; Implement a compliance system in collaboration with all stakeholders; To undertake compliance activities, including inspection, data cross checks and reporting; Implement a statistics and monitoring of fisheries; Provide extension support for Fisheries Committees; and Identify training needs for new tasks and appropriate institutions to replace existing donor projects. 	<ul style="list-style-type: none"> Fishery management training including comanagement; Donor support on management and compliance and management systems Compliance Unit established; Fisheries Management Unit established and functioning; Attending international forums; Systems developed to monitor the implementation of measures requiring monitoring, control and surveillance (e.g. Log Books and reporting); MoUs in place with other agencies including Coastguard & Armed forces and CFHC; Training fishery inspectors & design of standard operating procedures for compliance; and Acquiring compliance equipment.
National Aquaculture Development Agency (NAQDA)	Recommendation that compliance be passed to DFAR.	<ul style="list-style-type: none"> Acquire participatory co-management skills for reservoir management
3. Delegated implementation		
FCS	<ul style="list-style-type: none"> Provide advice in the development of fisheries policy; Undertake Participatory co management responsibility with other stakeholders; Voluntary code of conduct systems developed within FMAs. 	<ul style="list-style-type: none"> Awareness training in fisheries management measures and approaches; Training in compliance issues; and Local compliance equipment provided.
4. Research, education & extension agencies		
National Aquatic Resources Research and Development Agency (NARA)	<ul style="list-style-type: none"> Conduct stock assessments and advice to MFAR, Fisheries Committees, National Advisory Committee for tuna and international (IOTC); Monitoring catch & effort data of commercial fisheries; Provide advice on technical conservation measures; and Provide support for extension. 	<ul style="list-style-type: none"> NARA staff trained in monitoring processes; Analytical equipment provided for research; and Attending international forums.
National Institute of Fisheries and Nautical Engineering (NIFNE)	<ul style="list-style-type: none"> Conduct courses of study and training programmes in fisheries management & compliance. 	<ul style="list-style-type: none"> Strengthening of commitment to supporting technical officers (MFAR, DFAR) and fishers; Training and capacity building for NIFNE staff.

4.3: Marketing, food health and nutritional issues

Sri Lanka has established a good track record in quality control, for the export of fresh tuna, tuna loins and shrimp. The sector now comprises 27 processing firms with increasing levels of internal and external investment into the sector. This is partly because of Sri Lanka's domestic catch, allied to foreign landings, as well as regular flights to international locations.

Sri Lanka's domestic fish consumption is 16 kg per capita. Fish is largely sold whole or dried, with tuna forming the staple product and other fish such as sear fish and prawns. Dried fish, Maldivian fish, fermented fish (jaadi and smoked fish) are also very popular on the local market. Inland fishers were slow to penetrate the market, but now represent a low price staple product (mainly carp) for inland consumers.

Processed products such as value added minced fish, pickles, sausages, fish balls, and frozen fish have been developed through cooperation with local processors and Institute of Technological Innovation (ITI). These are sold in supermarkets. Additional by-products are also being developed. These include tuna offcuts made into soups, fish ambulthial, gelatine (from fish skins) and high quality oils/orutal.

The sanitary conditions of most coastal and municipal markets are reported as extremely poor, requiring improvements in general hygiene and access to water and ice. The new central fish market of Peliyagoda is expected to reach high standards. However, most markets require constant monitoring by DFAR QC inspectors and the Ministry of Health.

DFAR will also be expected to monitor food safety and educate fishers and market vendors to improve the traceability and quality of the fish.

The market distribution system is reported to be operating well, with coastal fish being sold into inland markets. However, stronger links could be formed between fisher cooperatives and fish processors.

Government policy has focused heavily on fish as a source of nutrition for the poor. Most significant is the fact that inland fish now represents some 10% of total market sales. This represents a considerable contribution to nutrition for households below the poverty line. CFC is reported as selling approximately 1% of Sri Lanka's domestic fish through its network of retail outlets. Tuna sold through the CFC network is sold at below the market rate. However CFC is also operating as a wholesaler for higher quality fish causing some distortion in market and much resentment from processors and retailers.

Loss in fish quality has become a major issue in the North Eastern and Eastern provinces forcing fishers to process lower value dry fish. This is because of loss of access to ice supplies.

4.3.1 Strengths and weaknesses

Table 27 below summarizes the fisheries sector strengths and weaknesses in the context of the proposed development initiatives.

TABLE 27: Strengths and weaknesses in Sri Lanka's fisheries food safety and domestic consumption and marketing

Key challenge	Strengths	Weaknesses
Food safety monitoring systems upgraded	<ul style="list-style-type: none"> Strong QC control and partnerships with the private sector; High (but insufficient) laboratory standards; and Regulations constantly upgraded to reflect change. 	<ul style="list-style-type: none"> Inadequate monitoring at port district level; Data base insufficiently robust (but compliant with EC standards); Lack of laboratory facilities; and Inadequate registration and evaluation of aquaculture drugs and feeds entering Sri Lanka.
Post harvest standards improved (MDBs)	<ul style="list-style-type: none"> Increasing trend for post harvest standards with improved vessel owner/processor linkages. 	<ul style="list-style-type: none"> Moderate to poor fish handling standards applied on the MDBs; Lack of knowledge of post harvest care; Inadequate landing facilities; and Poor domestic consumer awareness on quality issues (e.g. histamine).
Post harvest standards improved (Coastal vessels)	<ul style="list-style-type: none"> Short steaming distances means that products are in a reasonable condition. 	<ul style="list-style-type: none"> Inadequate use of ice; Lack of knowledge of post harvest care; Inadequate landing facilities; and Poor domestic consumer awareness on quality issues (e.g. histamine).
Landing sites and markets upgraded and improved	<ul style="list-style-type: none"> The development of a new central fish market at Peliyagoda to replace St Johns. 	<ul style="list-style-type: none"> Poor hygiene standards applied in coastal and inland fish markets; Inadequate access to basic facilities, e.g. water and ice; Insufficient inspection applied by Department of Health and DFAR; and CFC not fulfilling its duties to provide adequate ice supply.
Cold chain extended		<ul style="list-style-type: none"> Limited or no ice facilities in North and East locations; and CFC not fulfilling its remit in providing ice in some locations.
Increased domestic market penetration	<ul style="list-style-type: none"> Good distribution system from the coastal to inland locations; Product initiatives undertaken by the commercial private sector in cooperation with ITI; Product initiatives undertaken by NARA with coastal fishers in dried fish production; and Inland production available to poorer communities. 	<ul style="list-style-type: none"> Consumer resistance to new products; Insufficient direct linkages and partnerships between Sri Lankan processors and coastal & inland fishers (market Clusters); and CFC not sufficiently fulfilling its remit to supply cheap source of protein & distorting the market by acting as a wholesaler for secondary processors.

4.3.2 Weaknesses in existing support structures

The following weaknesses in support requirements are identified:

- greater need for extended coverage of DFAR Quality Control to promote traceability for export orientated products and general food safety for domestic markets;
- engage the support of Ministry of Health to cover fish food safety in municipal markets;
- extend the network of laboratories and to allow for testing of farm feeds and drugs;
- extend the Ice network to the North Eastern and Eastern provinces; and
- CFC should work in cooperation with MFAR on the development of marketing initiatives. There is considerable concern, voiced from within the industry over its distraction from its stated objective of promoting access to cheap source of product. Its distribution infrastructure (cold chain vehicles) is heavily underutilised.

4.3.3 Responsibilities and obligations of support organisations

Table 28 identifies the principal tasks required to support the design and implementation of marketing, food health and nutritional programs. Critical issues are as follows:

- (1) **MFAR:** The current focus within MFAR is towards promotion and facilitation of the export sector. This is complemented by a very strong DFAR QC inspection system. What is missing is a limited focus on the domestic market, covering the development and food safety in the network of coastal and inland markets, including the new central market, and promotion of consumer demand. MFAR needs to outline principal strategies through a policy document for improvements in these areas. Key partners in this initiative must be the private sector (processors and retailers), Ministry of Health and CFC.
- (2) **DFAR:** DFAR existing QC deployment is staffed by a group of highly competent professionals as acknowledged by DG Sanco. However, this should be expanded to improve safety throughout the food chain and promotion of extended traceability. The Log Frame proposes an additional 23 Assistant Quality Control Extension officers to be based at the AD offices, covering coastal markets, MDBs and coastal fishers.
- (3) **CFC:** CFC to work in cooperation with MFAR on the development of a marketing strategy.
- (4) **CRC:** ITI, NARA and private sector to work collectively through a Cooperative Research Centre.
- (5) **NIFNE:** To orchestrate, in cooperation with DFAR, a dedicated QC training program for fishers and market inspectors (DFAR and the Ministry of Health).

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TABLE 28: Institutional responsibilities and obligations in fish food health, marketing & nutrition

Institution	Tasks	Changes required to support activities
1. Fisheries policy		
Ministry of Fisheries and Aquatic Resources (MFAR)	<ul style="list-style-type: none"> • MFAR in cooperation with DFAR, Department of Animal Production & Health, CFHC and the private sector, to prepare a policy document which outlines the principal strategies on food safety; • MFAR in cooperation with private sector stakeholders, CFC, and Food Technology Research Organisations to prepare a policy document including identification of roles and responsibilities, for the promotion of consumer demand in Sri Lanka; • MFAR in consultation with Sea Food Exporters Association, NARA and DFAR to review the costs and benefits of tuna MSC certification; • Liaise with Treasury and BOI on tax incentives to support access to cheaper inputs (equipment etc.); and • Coordination of the development of the New Central Fish Market at Peliyagoda. 	The ambit of MFARs export division to be extended to include market research and marketing.
2. Implementation		
Department of Fisheries and Aquatic Resources (DFAR)	<ul style="list-style-type: none"> • Registration of fish processing establishments, monitoring quality of fish exports, imports of aquaculture feed and drugs and issuing export permits; • Upgrading the standards of fish sale outlets; • In conjunction with CFHC, Ministry of Health, regularly monitor the implementation of health standards in Sri Lankan port and wholesale/municipal markets; and • FSDD to promote the investment in small scale ice plants in North East and Eastern. 	<ul style="list-style-type: none"> • Extend DFAR QC network to District Offices; • Establish MoUs with Ministry of Health; • Support the extension of testing laboratories, through the support of Donor assistance; and • Support for the extension of an ice network in North Eastern and Eastern provinces, through donor funding and FCS initiatives.
3. Research, education & extension agencies		
National Aquatic Resources Research and development Agency (NARA)	<ul style="list-style-type: none"> • Setting operational procedures and awareness standards for improved standards on board multi day & coastal vessels; • Product development in cooperation with ITI and the private sector; and • NARA & NIFNE to develop training programs in post harvest handling. 	Development of food health and nutrition standards.
National Institute of Fisheries and Nautical Engineering (NIFNIE)	NARA & NIFNE to develop training programs in post harvest handling.	NIFNE's remit extended to include post harvest handling.

4.4 Fisheries sector growth: Fleet development

The MFAR Ten Year Development Policy Framework places a strong emphasis on growth in the tuna fishery, catching and exports, as core component of sector growth. It is acknowledged that growth in the tuna sector is a realistic development goal, however, the realization of growth requires a number of fisheries management measures to be put into place (Section 4.2.4 above), if the sector is to become sustainable.

The Multi Day Boat fleet is growing at a rapid rate, up 65% from 1 581 to 2 613 in the last two years (2004-2006). The fleet is reported as being highly profitable with estimated trip profits of Rs 2 to Rs 4 Laks (US\$2 000 -US\$4 000).

Fleet construction was heavily subsidized with the provision of re-financing loans through Commercial Banks. However, the sector saw this as an indirect subsidy and didn't repay the loans. Presently, the high returns on capital are resulting in continued expansion without subsidy.

In realization of the high demand for Grade A export quality fish, the fleet is rapidly converting from netting to long lining.

As mentioned earlier, there is no management regime applicable to this sector. However, IOTC is debating applying quotas to member countries, at which time Sri Lanka will have to adapt to a management system that incorporates some form of quota management system. The present concern is that the Sri Lankan fleet will become over capitalized if the present growth rate in boat numbers continues.

It is difficult at this stage to be able to judge the viability of the fleet and any potential impact that management measures may have, because of the non availability of fleet costs and earnings data collection and analysis.

The coastal fleet continues to thrive, but with some transition of its fishers from one day boats to MDBs. This should reduce effort in the coastal zone. However, there is no scientific data available that allows to judge the impact of this sector on fish stocks in the coastal zone, or the inter relationship with the offshore fishery. It is also noted that some coastal vessels are converting from gill netting to long lining.

Unlike the MDB sector, in many regions, the coastal fishers are members of local cooperatives. However, these cooperatives have yet to realize their potential as engines of growth. Much of their present activities are linked to the provision of micro credit through a system of village banks.

4.4.1 Strengths and weaknesses

Table 29 below summarizes the fisheries sector strengths and weaknesses in the context of the proposed development initiatives.

TABLE 29: Strengths and weaknesses of Sri Lanka's marine fisheries sector

Key challenge	Strengths	Weaknesses
Fishery cooperatives strengthened	<ul style="list-style-type: none"> • Between 120-300 cooperatives are reported as operating effectively; • A small number of cooperatives are in the process of developing business plans for expansion of their economic activities; • Peer pressure on illegal activities is generated through FCS demonstrating some capacity of fishers to engage in participatory co-management; and • Some FCS have developed into banks supporting small scale fishermen. 	<ul style="list-style-type: none"> • The evolution of cooperatives has been slow to develop in some regions. • Cooperative functions are largely restricted to small scale banking and the generation of village micro credit activities; • Cooperatives are confined to village level activities, making generation of group level activities / formation of clusters too small; • Villager cooperation in some villages is very weak due to poor leadership and conflicts between different resource users; • Cooperative development in the North & East has been hampered by the ethnic conflict. • Cooperative development is reliant on Government intervention at inception, and a large degree of facilitation; and • NFFC is an extremely weak organisation with limited capacity to undertake any activities.
Conversion & expansion of tuna long line fleet	<ul style="list-style-type: none"> • High commercial returns for fishing vessels. • Sri Lanka strategically well placed to take advantage of available tuna resources (proximity to fishing grounds, good transport logistics) . • Some vessels converting to long lining with significant improvements in quality allowing improved export earnings. • Strong linkages between MDB operators and an expanding tuna processing and export industry. and • IFAD prepared to support the development of the high seas fishery. 	<ul style="list-style-type: none"> • There are no controls on access, no management measures on catch and effort limitations applied and no adherence to the precautionary principal by MFAR; • Coastal fisheries are regarded as a significant risk to tuna fisheries by IOTC; • IOTC is expected to introduce management controls; • Sri Lanka has no high seas fleet (> 24 M), as compared with other international competitors; • Some MDB fishers are primarily dependent on gill netting; • Fishers operate in international waters and in waters of other country jurisdictions; • Despite apparent vessel profitability, fishing vessels have a high non repayment of debt and are regarded as high risk by the Banks; • There are conflicts between MDB and coastal fishers; • Fish quality is inadequate due to poor handling practice and inadequate use of ice; • Inadequate access to bait (milkfish/squid); • Deep water port facilities are limited; • Little compliance activities in the fishery; • Weaknesses in information systems; and • Shark by-catch issues.
New under-exploited fisheries developed	<ul style="list-style-type: none"> • Perceived opportunities for deep water longlining; • Perceived opportunities for seasonal squid fishery. 	<ul style="list-style-type: none"> • Fishing vessels heavily focused on existing fishing operations; and • Shark by-catch issues.
Fisher capacity building (fishing & navigations)	<ul style="list-style-type: none"> • Some transfer of information between fishers. 	<ul style="list-style-type: none"> • Existing training seen as inaccessible (coastal fishers) and out of touch (easier to learn from fellow fishers). and • Existing training insufficiently orientated to meeting the country's development needs – improved efficiency in gear deployment, improved quality, navigation & fish finding, safety.

4.4.2 Weaknesses in existing support structures

The MFAR Ten Year Development Policy Framework advocates a public /private partnership. However, the main engines in growth for this sector might have to come from the private sector. All that Government can do is to provide a structure to promote confidence, and restore the financial sector's confidence to invest in the sector. This requires adoption of a management system that can support a sustainable fishery in the medium to long term. In addition, the GoSL needs to place a stronger emphasis on training fishers. The present capacity of NIFNE to undertake such a training program is very weak.

The coastal support system is evolving through the creation of banks. However, the small sizes of the cooperatives, and the limited financial grants provided, confine the use of credit to village level micro activities. There is a clear need for increased empowerment and commitment to larger scale economic activities. Very few cooperatives for example, have engaged in the marketing of their products. The growth impetus of the cooperatives relies heavily on Government support through capacity building (DCD) and village grants (FSDD). There is very little support provided to the cooperatives from its national organization (NFFC), which appears to be extremely weak.

Whilst the focus of economic development relates to facilitating private sector initiatives, there are some activities that could require the support from donors.

Post Tsunami, there are only limited deep water harbour facilities that can cater for the larger MDBs. Furthermore, the network of anchorages and landing sites for coastal fishers is still under development. The construction of such facilities could be undertaken by GoSL in cooperation with donors.

Co-operative Research Centre (CRC): A form of interactive cooperation, with limited life span based on facilitating Research, development and extension programs. NARA and NIFNE, including establishing private sector partnerships could undertake joint initiatives, with the focus on improving returns to the economy on the sustainable use of fishery resources (Appendix J).

Finally smaller scale donor support could be forthcoming for the following research initiatives:

- project based provision of an International Master Fisherman and National Business Analyst;
- technology upgrade through satellite linkages; and
- experimental fisheries program.

4.4.3 Responsibilities and obligations of support institutions

Table 30 identifies the principal tasks required to support the design and implementation of marine fisheries development as stipulated in the MFAR ten year development policy. Critical issues are as follows:

(1) MFAR: The organisation should prepare a strategic plan for the development of the tuna long line fishery. In this context MFAR would be required to work with stakeholders, most specifically at behest of the private sector to improve conditions for access to finance and to remove some fiscal impediments. Other than the private sector, this will require liaison with Department of Planning, Bank of Sri Lanka and the BOI. The principal MFAR participants in this area would be an economist (working with NARA) and the Export & Marketing Division.

(2) DFAR: The FSDD unit which has transferred to MFAR should return to DFAR control. This is because the coordination requires the active support of the AD's office, which falls under the responsibility of DFAR. FSDD would also combine some of its activities with the Fisheries Management Extension Service. It should be noted that facilitation of cooperative development must be seen as a relatively important activity by government administrations, hence it warrants a Director in such a position. Facilitation of cooperative development would also require the deployment of at least two officers per district (28). In time (10 years), the responsibilities should pass to the NFF as the cooperatives become more financially empowered to support the lead organisation. In the long-term the FSDD would be required to facilitate cooperative development through additional focus on grants (to improve the capacity of empowerment), fisheries clusters and participatory co-management. Empowerment issues are presently well handled by FSDD but expansion is limited due to inadequate human resources.

(3) NFFC/ FCS: As FCS becomes increasingly empowered it should become a realistic target for NFF to become increasingly more viable as a coordinating body for the FCS. This may require the support of one of the principal NGOs operating in the FCS structure. FSDD should where possible hold a number of joint workshops with NFF as a means of facilitating a transition away from a Government to private sector sponsored system.

(4) Co-operative Research Centre (CRC):

- a) **NARA:** a special Donor project should be set up within an integrated Division within NARA incorporating supervision under MBRD, FTD and SED, or a combined unit of these divisions.
- b) **NIFNE:** the Organisation has to identify itself as a service provider to support the development of coastal and MDB fishers, as well as fishery cooperative societies.

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TABLE 30: Institutional responsibilities and obligations in fishery development

Institution	Tasks	Changes required to support activities
1. Fisheries policy		
Ministry of Fisheries and Aquatic Resources (MFAR)	<ul style="list-style-type: none"> MFAR to prepare a policy document which outlines the principal strategies that will support the development of the tuna long line sector, including fishery management plan, investment incentives, key product promotion activities, training needs and principal public sector / private sector participants; Liaise with the Department of Planning (Treasury) and Bank of Sri Lanka on refinancing packages for the development of the commercial fishery sector; Liaise with Treasury and BOI on tax incentives to support access to cheaper inputs (squid bait, equipment etc); Support the promotion of credit availability through Banks; Liaise with Donors on the possibility of supported specific re financing packages through Bank of Sri Lanka to fishing vessel improvements; Liaise with Donors on the possibility for support an upgrade and deepening of two harbours; Work with Donor Agencies to support the establishment of pilot vessels to target the high seas tuna fishery using long lines; and Policy on the use of CRCs in fisheries development. 	<ul style="list-style-type: none"> Strengthen administrative structure to incorporate policy advice on investment activities (economist); Establish specific policy units with functions of facilitating policy development in fleet growth/sustainability; and Initiate planning processes including implementation of the Log Frame, defining institutional activities and activity review processes which contribute to the above.
2. Implementation		
Department of Fisheries and Aquatic Resources (DFAR)	<ul style="list-style-type: none"> Guidance and supervision of FCSs to enhance their efficiency including institutional strengthening and business/marketing training to support the formation of commercial cluster. 	<ul style="list-style-type: none"> FSDD to engage more proactively with the private sector to encourage the development of commercial trading structures; FSDD to undertake joint Workshop initiatives with NFFC; Donor support for expansion in micro credit, facilitation of cluster development and empowerment of NFFC.
Department of Cooperative Development		
National Federation of Fishermen (NFFC)	<ul style="list-style-type: none"> Guidance and supervision of fisheries coops societies to enhance their efficiency; and Promoting alternative livelihoods. 	<ul style="list-style-type: none"> NFFC structure to be reviewed allowing for substantial improvement in the organisations capacity.
3. Research, education & extension agencies		
Fisher Cooperative Societies (FCS)	<ul style="list-style-type: none"> Promote the development of micro credit through banks; and Strengthening FCS to focus on Cluster partnerships with Fish traders and processors. 	<ul style="list-style-type: none"> Business market training for FCS leaders; and Training in fish quality.
National Aquatic Resources Research and development Agency (NARA)	<ul style="list-style-type: none"> Prepare a manual on long liner gear specifications and fish handling; Identify new fisheries; Assist the Bank sector in the preparation of Business Plans; Support the creation of real time information data base on tuna migrations; and Resource surveys undertaken for new target fisheries. 	Support from Donor for: <ul style="list-style-type: none"> Project based provision of an International Master fisherman and National Business Analyst; Technology upgrade through satellite linkages; and Experimental fisheries program.
National Institute of Fisheries and Nautical Engineering (NIFNE)	<ul style="list-style-type: none"> Provide training courses in improved efficiency in gear deployment, improved quality, navigation & fish finding, safety. 	<ul style="list-style-type: none"> Strongly focus on fisher empowerment and effectively utilise existing infrastructure in the fishery harbours and mobile units (for coastal); and Provide development training for fisher cooperatives (business management, marketing and pricing systems).

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National Aquaculture Development Agency (NAQDA)	<ul style="list-style-type: none">• Facilitate the development of live milkfish trading sector in locations adjacent to the deep water fishery ports.	<ul style="list-style-type: none">• Provide extension (and information) for the development of milkfish culture.
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4.5 Fisheries sector growth: Aquaculture development

The MFAR Ten Year Development Policy Framework places a strong emphasis on growth of the aquaculture sector. In comparison to other Asian countries, aquaculture development in Sri Lanka has been very slow in developing, and has suffered similar setbacks as experienced in other competitor countries, most specifically inadequate disease control and vulnerability to fluctuating market prices.

Some positive initiatives can be summarized below:

- the GoSL has invested heavily in the dredging of the Dutch Canal which provides the source of water for the ponds;
- NAQDA, in cooperation with the industry has initiated a disease monitoring program for hatcheries and farms;
- seasonal and perennial tanks are now becoming a source of protein for inland domestic consumers with the NAQDA / ARDQIP support in fry production and stocking programs
- pilot projects developing the capacity to support the establishment of FCS and data monitoring programs; and
- export orientated species are beginning to develop as commercial and village led micro enterprises.

It is true to say that Sri Lanka, with its highly suitable natural habitat, can realize a much improved level of production.

4.5.1 Strengths and weaknesses

Table 31 below summarizes the strengths and weaknesses in the aquaculture sector in the context of the proposed development initiatives.

TABLE 31: Strengths and weaknesses of Sri Lanka's inland and marine aquaculture sector

Key challenge	Strengths	Weaknesses
Shrimp sector strengthened and sustained through labelling and certification	<ul style="list-style-type: none"> • reasonably strong entrepreneurial skills; • good sites; • movement towards Bio secure certification; and • strong QC, R&D support activities. 	<ul style="list-style-type: none"> • some susceptibility to disease (much reduced); • poor track record in debt liability; • the sector is vulnerable to world price fluctuations; and • the sector is relatively small as an international trader.
Seasonal / perennial tank production expanded	<ul style="list-style-type: none"> • under utilised water resource and good alternative livelihood activity in remote areas • accesses inland markets and improves food security; • community fishers increasingly well organised (FCS and some joint marketing initiatives); and • supporting stocking program. 	<ul style="list-style-type: none"> • demand for products has been slow to evolve; • high degree of poaching in perennial tanks undermining commercial sustainability; • reliance on stocking; • slow transition from Government supported to private sector supported stocking initiatives; • poor integration of irrigation and fish production needs; and • insufficient extension skills for participatory co-management approaches.
Expansion of small scale freshwater aquaculture systems	<ul style="list-style-type: none"> • under utilised water resource and good alternative livelihood activity for farming communities; • low capital input requirements; and • potentially strong export market demand (fresh water prawns and tilapia). 	<ul style="list-style-type: none"> • no tradition in Sri Lanka; • requires capitalisation of a private hatchery sector; and • requires a significant extension program, perhaps supported by Donors.
Expansion in mariculture & inland cage culture	<ul style="list-style-type: none"> • under utilised water resource and good alternative livelihood activity in remote areas; • strong export potential for particular species – barramundi, sea bass. 	<ul style="list-style-type: none"> • requires increased capitalisation of a private hatchery sector; and • requires increased private sector partnerships.
Expansion in aquatic plants and ornamental fish culture	<ul style="list-style-type: none"> • high export demand; and • good alternative livelihood activity. 	<ul style="list-style-type: none"> • no management controls on the catching and trade of marine ornamental fish; and • aquatic plants.

4.5.2 Weaknesses in existing support structures

The MFAR Ten Year Development Policy Framework advocates a public/private partnership. However, the main engines in growth for this sector have to come from the private sector. ARDQIP, which is due to finish in 2009, is providing the basis for supporting the growth in inland fisheries through a series of measures that will in time become sustainable.

The Government, as assisted by BOI initiatives, can provide a structure to promote confidence, and restore the financial sector's confidence to invest in some of the sectors that have witnessed a down turn, most specifically shrimp. The shrimp sector specifically needs to adapt its practices to provide a niche product for the World market. This requires the development of biosecure systems and the adoption of Better Management Practices, incorporating the Principles of Responsible Shrimp Farming.

NAQDA's role as a development organization, will continue to strengthen through extension. However, it a crucial area of concern is the separation of the present research (NARA) and extension organizations (NQDA), and the need for greater interaction with the private sector would suggest a change in structure. An initiative would be to develop an integrated aquaculture research program under a CRC (Appendix J). The CRC is a form of interactive cooperation (as used in Australia), with limited life based on facilitating research, development and extension programs. NAQDA, NARA and NIFNE, including establishing private sector partnerships would undertake joint initiatives, with the focus on improving returns to the economy on the sustainable use of fishery resources. This initiative could be funded by GoSL, private sector and donors.

Most specifically, from the team's observations, the two principal organisations, NARA and NAQDA appear quite remote from one another. The CRC would facilitate greater interaction.

4.5.3 Responsibilities and obligations of support institutions

Table 32 identifies the principal tasks required to support the design and implementation of fisheries management systems in inland and aquaculture. Critical issues are as follows:

(1) MFAR: The organisation, in cooperation with NAQDA, should prepare a strategic plan for the development of the aquaculture sector. MFAR would be required to work with stakeholders, most specifically at behest of the private sector to improve conditions for access to finance and to remove some fiscal impediments. Other than the private sector, this will require liaison with Department of Planning, Bank of Sri Lanka and the BOI. The principal MFAR participants in this area would be an economist (working with NARA) and the Export & Marketing Division.

(2) NAQDA: The organisation should provide support for the above initiative, together with undertaking key implementation activities under the auspices of a CRC (See below)

(3) Co-operative Research Centre (CRC): All the tasks identified in Table 32 would require an integrated approach such that NAQDA will promote private partnerships. NAQDA and NARA should respond to the initiatives of the private sector, and discuss the implementation of these in cooperation with NIFNE for training purposes.

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TABLE 32: Institutional responsibilities and obligations to support development in the inland and aquaculture sector

Institution	Tasks	Changes required to support activities
1. Fisheries policy		
Ministry of Fisheries and Aquatic Resources (MFAR)	<ul style="list-style-type: none"> MFAR in cooperation with NAQDA, to prepare a policy document which outlines the principal strategies that will support the development of the aquaculture sector, investment incentives, key product promotion activities, training needs and principal public sector / private sector participants; Liaise with the Department of Planning (Treasury) and Bank of Sri Lanka on refinancing packages for the development of the aquaculture sector; Liaise with Treasury and BOI on tax incentives to support access to cheaper inputs (equipment and commercial feeds); Support the promotion of credit availability through banks; Liaise with donors on the possibility of supported specific re financing packages through Bank of Sri Lanka to support fish farm development, including through existing agricultural loan schemes; and Liaise with donors on support for small scale aquaculture development (both inland and marine?). 	<ul style="list-style-type: none"> Strengthen administrative structure to incorporate policy advice on investment activities (economist).
2. Implementation		
Department of Fisheries and Aquatic Resources (DFAR)	<ul style="list-style-type: none"> To undertake compliance activities, including inspection, data cross checks and reporting. 	<ul style="list-style-type: none"> To recruit and train fishery inspectors.
National Aquaculture Development Agency (NAQDA)	<ul style="list-style-type: none"> NAQDA in cooperation with MFAR, to prepare a policy document which outlines the principal strategies that will support the development of the aquaculture sector, investment incentives, key product promotion activities, training needs and principal public sector / private sector participants; and Implementation of strategic plans for development of the different sub-sectors (inland, marine, and brackish water). 	<ul style="list-style-type: none"> Expansion in extension activity (including recruiting and training extension officers) in small scale aquaculture (pond culture, ornamental fish and plants).
3. Research, education & extension agencies		
National Aquaculture Development Agency (NAQDA)	<ul style="list-style-type: none"> To undertake fingerling (and post-larvae) production with a transition to private sector in 10 years; Stocking of tanks with a transition to private sector in 10 years; Promoting the development, through extension, of fresh water, brackish water aquaculture and mariculture; Promotion, through extension, development of aquatic plants and ornamental fish for export; Encourage private participation in aquaculture; Monitoring and regulation of shrimp; and Husbandry training of NAQDA, public and private sector personnel. 	<ul style="list-style-type: none"> To secure donor support for expansion in small scale aquaculture; Facilitate access to information through attendance at technical workshops in S & SE Asia; Increased association with private sector stakeholders (feed suppliers, hatcheries and processors); Conduct an active workshop program with private sector stakeholders; and To recruit an economist required to facilitate the development of business models for new small aquaculture systems.
National Aquatic Resources Research and development Agency	<ul style="list-style-type: none"> Conduct resource survey for disease free marine shrimp brood stocks; Promote diversification into polyculture rotation systems; 	

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Institution	Tasks	Changes required to support activities
(NARA)	<ul style="list-style-type: none"> • Promote an organic shrimp product from extensive systems; • Plan and implement a pilot program for introducing standards for organic farming; • Training in new techniques for aquaculture & mariculture; • Develop input / output models to support business development in new aquaculture; • To evaluate prospects for introducing other species (in cooperation with the private sector); • Develop breeding technology and nutrition for new species; • Selecting test sites for inland aquaculture; • To participate with NAQDA in regular farmer workshops; • Product development; and • To develop ornamental fish breeding, tissue culture and live rocks. 	
National Institute of Fisheries and Nautical Engineering (NIFNIE)	<ul style="list-style-type: none"> • To organise farmer workshops for fish farmers in aquaculture principles and practice in partnership with NAQDA & NARA. 	<ul style="list-style-type: none"> • recruit Aquaculture training specialists and develop training partnerships with the private sector

4.6 Coastal conservation, management and control

Since the 1981 Coast Conservation Act was passed in Sri Lanka, coastal zone management policy has evolved from a policy to prevent coastal erosion into an integrated policy aimed at addressing not only the causes of coastal erosion but also habitat degradation and the wider issue of sustaining coastal livelihoods. The approach includes efforts to decentralise, strengthen local institutions and work with coastal communities towards sustainable resources management.

BOX 19: Definition of CCD's operational area within the coastal zone

The mandate of the CCD for conservation and management of the coastal environment lies within the Coastal Zone, defined in the Coast Conservation Act 1981, as the area lying within a limit of 300 m landward of the mean high water line and a limit of 2 km seaward on the mean low water line; in the case of rivers, streams, lagoons, or any other body of water connected to the sea either permanently or periodically, the landward boundary extends to 2 km measured perpendicular to the straight base line drawn between the natural entrance points and includes the waters of such rivers, streams and lagoons or any other water body so connected to the sea. All beaches in Sri Lanka are public property in accordance with the CCA.

(Source: CCD 2003)

Table 33 below identifies the principal strengths, weaknesses of the coastal conservation, management and control sector in the context of the proposed development initiatives.

The main observations can be summarized as follows:

- high costs of beach replenishment associated with coastal protection as a result of inadequate control as applied to sand extraction;
- weak inter agency dialogue on verifying building rights within the coastal belt;
- insufficient resources (and cooperation between agencies applied to checking activities on the coastal zone); and
- the slow pace in advancing Special Area Management Sites (SAM).

However, whilst areas of weakness are identified, the principal conclusion is that regulatory gaps are identified and subsequent changes have been addressed in the new draft amended Coast Conservation Bill.

TABLE 33: Strengths and weaknesses of coastal conservation and coastal resources management

Key challenges	Strengths	Weaknesses
Resource exploitation issues	<ul style="list-style-type: none"> • 2 SAMs operating successfully with provision for extension to 9 sites (compared to 70 proposed in the CZMP); • Short to medium term damage mitigation using beach replenishment, groynes, revetments and dykes. 	<ul style="list-style-type: none"> • loss or degradation of sandy beaches and coastal lands due to natural erosion and excessive coastal and inland sand extraction; • Sedimentation and silting of corals and sea grasses due to land use wastes; • Coastal structures interfering with littoral transport including anchorages and harbours; • Resource and capacity constraints for erosion management; • Pollution from urban and industrial waste disposal and agricultural inputs; • Coral extraction; • Coral degradation due to boat damage and application of destructive fishing methods for ornamental fish species; • Uncontrolled exploitation and land use in the coastal zone (shrimp farms, building, extraction of wood and poles from mangroves); • Destruction of sand dunes, barrier beaches and sand spits; and • Pollution from oil spills and other discharges.
Coastal resource management	<ul style="list-style-type: none"> • Commitment to revised CZMP every four years; • Recognition of SAM/APCs; and • Regional or local zoning plans based on smaller scale <i>Shoreline Management</i> to control and direct development activities away from the coastal zone. 	<ul style="list-style-type: none"> • Reliance on short term damage mitigation through short term protection measures (crisis management), consequently beach replenishment is continuous and expensive; • Controls on extraction (sand and coral) are undermined by the lack of cooperation between agencies. Such agencies should also include inland sites where sand extraction impacts on beach replenishment; • Inadequate awareness of the impacts of sand and coral extraction, siltation of sea grass beds and coastal pollution; • The slow pace in extension of SAM sites (only 9 new sites presently in operation); • Consultation processes need to be facilitated; and • Community awareness programs require strengthening.
Monitoring	<ul style="list-style-type: none"> • Monthly interaction meetings with other Government Offices through District Secretary Planning Offices; • Water quality assessment & hydrodynamic checks undertaken (CCD); • Coastal prediction models developed; • GIS mapping (NARA); • Bathometric tests (NARA); 	<ul style="list-style-type: none"> • Increased need for training in monitoring processes; and • Inadequate communications between stakeholders outside SAMs.

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	<ul style="list-style-type: none"> • Land inspections; and • CCCs identifying land use irregularities. 	
Control system	<ul style="list-style-type: none"> • Permit & EIA systems in place; • Revisions made to Coast Conservation Act to account for control deficiencies (permit systems, interaction with other agencies, removal of unauthorized structures, extension of powers and penalties); • Prohibitions applied to removal of corals, sand from specified areas and developments in designated protection areas and in close proximity to archaeological sites; • Greater community participation by SAMs; and • Cumulative Impact Assessment Monitoring. 	<ul style="list-style-type: none"> • Inability to secure cooperation with local authorities and inland licensing authorities, such that other planning processes take precedence over coastal zone protection (including conflicts with MFAR re the establishment of anchorages and harbours); • Local political interference undermines permit systems; and • EIAs and resource extraction monitoring not conducted for coastal and inland locations (irrigation, sand extraction, dams) to account for impact on beach replenishment.
Compliance system	<ul style="list-style-type: none"> • Engagement with District offices and local authorities; and • Access to control organizations (Police marine division, local CCD officials, MPPA staff). 	<ul style="list-style-type: none"> • Inadequate resources applied for controlling shoreline activity; • Inadequate frequencies of inspections; • Insufficient use of police marine division, local CCD officials, MPPA staff; and • Limited training of CCD personnel.

4.6.2 Management systems

In the past, coastal management, control and protection in Sri Lanka has considerably benefited from several donor initiatives. A brief summary of the key issues are identified below.

The CCD has in the past relied upon the regulatory framework of the Coastal Conservation Act No 57, 1981 (CCA). This is reflected in the CZMPs of 1990 and 1997.

This focuses very heavily on the following regulatory measures:

- enforcement of a Permit system;
- prohibition of activities;
- designation of setback standards, variances and exemptions;
- development restrictions;
- compliance monitoring;
- removal of unauthorized structures;
- delegation of powers;
- provision of guidelines and standards for specified activities; and
- requirement for Environmental Impact Assessments (EIA) and Initial Environmental Examination IEE).

However, the management process has seen an increasing trend towards using more community participation through Special Area Management (SAM), inter agency coordination, monitoring, research and increasing awareness of coastal zone management issues.

BOX 20: Definition of a SAM

Special Area Management (SAM) is a locally based geographically specific planning process that is a highly participatory practice allowing for comprehensive management of natural resources with the active involvement of resources through which decision-making, responsibility and authority are shared between government and local resource users. The government agencies assume the role of facilitator through provision of technical and financial support. The local community groups become the custodians of the resource.

4.6.3 Proposed changes to the Coast Conservation and Coastal Resource Management Bill in support of the Ten Year Development Policy Framework of the Fisheries and Aquatic resources Sector

Appendix K identifies the areas not covered by the CCA 1981. These relate to the following:

- declaration of affected areas;
- beach parks;
- conservation areas;
- SAMs; and
- coastal access.

Suggested draft changes to the Bill are provided. Appendix K lists additional suggestions and proposed amendments to the legislation on coast conservation and coastal resource management to establish better linkages to fisheries management.

It is recommended that the *Coast Conservation Act No.57 of 1981 and Amendment Act No. 64 of 1988* will be amended in order to provide for regulations relating to the SAM/APC process, and in particular to provide for^{64.})

- clearer definitions in the selection of the sites, acknowledging that smaller areas have a greater chance of success;
- definition of clear cut work programs for the supporting agencies, particularly in respect to extension support requirements and identification of human and financial resources (and how the latter may be funded);
- full and active participation of the stakeholders, most specifically sensitizing politicians of the need for community participation in the planning and implementation process;
- clear opportunities for local communities to derive tangible benefits from the SAM process so that they are motivated as participants;
- a mechanism for participatory monitoring and feedback systems, with the ability to adapt plans as issues arise; and
- decision making process during the (planning and implementation process must be clear and well documented, communicating binding decisions to all of those involved).

It is also noted that some specific implementation issues will have a bearing on fisheries activities within the SAM. These, e.g. no take zones and prohibitions of certain fishing activities, may need to be incorporated into fisheries management plans as and when the SAM and the FMA jurisdictions correspond. The recommendation therefore is, that these will follow a voluntary code of conduct as endorsed by the local fishing community, which under the FMA process, could become legally binding. In the event that the SAM and FMA do not correspond, both CCD and DFAR would then be required to identify appropriate actions, for example defining a corresponding FMA to correspond with the SAM. It should be noted, that both systems are not one and the same, as often confused in several preceding evaluations (Box 16 and Box 20).

4.6.4 Activities, outputs and assumptions

CCDs activities relate to the following core themes: rehabilitation and enhancement of the coastal zone protection and habitat degradation, as well as protection of coastal systems. The Log Frame highlights specific activities that mitigate damage to coastal zone (beach replenishment, restoration of habitats and alternative livelihoods) and compliance systems, e.g. permits. The three key activities of CCD are: **engineering, permit systems, SAMs**. The principal mandate for CCD's activities is derived from the Coastal Zone Management Plan.

The Log Frame highlights a series of activities which are required to achieve the desired results:

- Identification of potential problem areas and solutions;
- Protection rehabilitation and enhancement of coastal protective structures;
- Coastal resource quality improvements;
- Development of the CZMP;
- SAM / APC management plans created, upgraded and implemented;
- Upgrading of standards and legal statutes to strengthen management systems;
- Strengthening of compliance systems;
- Application of the permit system;
- Promoting comanagement;

⁶⁴ CZMP (2003)

- Creation of beach parks and recreational facilities; and
- Eco-tourism development program and alternative employment opportunities.

4.6.5 Responsibilities and obligations of support institutions

Table 34 identifies the principal tasks required to support the design and implementation of CZM systems in support of implementing the Ten Year Development Policy Framework of the Fisheries and Aquatic Resources Sector.

The following changes can be recommended in order to support an efficient implementation:

(1) MFAR: There has been a series of donor initiatives that have undertaken the role of policy design. While these activities have a direct link to the Ministry, it would appear that policy issues are decided by CCD, as opposed to the MFAR operating a coordinating role.

Clearer distinction should be made between policy design and development (MFAR) and implementation (CCD), with stronger emphasis on technical support within MFAR in designing management systems and monitoring developments in the CZM sector as well as in international rules (UNCLOS) and relevant codes of conduct.

The design process will include appropriate consultative processes, specification of control measures used, and monitoring and compliance systems to be applied.

The MFAR Legal Officer, as specified in the section dealing with fisheries management would also work on the design of Legal Statutes for CZM issues.

(2) CCD: CCD has the responsibility for the management, monitoring and control of the regulatory provisions (permits scheme). Seventy two Planning and Development Assistants, along with 12 Technical Assistants are charged with these activities. Additional part time support may be available from the MPPA (64) and Police Marine Division (37). These officers require capacity building and training in compliance activities. Important monitoring needs identified are for water quality assessments and land surveys.

SAMs require the support of extension officers. The Log Frame predicts that in addition to the 9 SAMs currently under development, there will be a further 3 SAMs and 2 APCs initiated each year. In 10 years this will require 54 extension officers. At the moment, there is no provision within CCD for these officers. Historically, extension support has been provided by the concurrent donor programs. Clear distinction should be made between compliance and extension.

MFAR/CCD may therefore consider the following options:

- earmark some of the Planners/Development Assistants, 9 in year 1 (current SAMs), 14 in year 2 (2 APCs, 3 SAMs/annum), 19 in year 3, 54 by year 10 as Extension Officers;
- expand the existing CCD Cadre to account for these dedicated extension activities;
- seek complementary private sector funding (donations or tourist levies) to support SAM Extension Officers;
- seek further donor support to provide SAM Extension Officers.

The Planning and Development Assistants, Technical Officers, Marine Police and MPPAs, along with the SAM Extension Officers will require dedicated training in their respective roles

of planning, compliance and extension. This may have to be derived from additional Donor support.

TABLE 34: Institutional responsibilities and obligations in coastal zone management

Institution	Tasks	Changes required to support activities
1. Coastal zone policy		
Ministry of Fisheries and Aquatic Resources (MFAR)	<ul style="list-style-type: none"> • Provide policy support to CCD in the development of CZM policy; • Analyse, consult and develop the CZM policy in consultation with CCD and stakeholders; • Coordination, facilitation, monitoring and supervision of the functioning of the agencies and institutions to support management systems; and • Provide advice to the Minister responsible for fisheries and coastal resources under the <i>Fisheries and Aquatic Resources Act No.2 of 1996 and Amendment No.4 of 2004</i>. 	<ul style="list-style-type: none"> • Strengthen administrative structure to incorporate policy advice (coastal zone specialist, legal officer & environmentalist); • Coordination of workshops on management systems; and • Attending international forums.
2. Implementation		
Coastal Conservation Department (CCD)	<ul style="list-style-type: none"> • Provide technical support in the development of CZM policy; • Legislative development and permits; • Manage the SAMs and APCs in consultation with stakeholders; • Implement a compliance system; • Implement a statistics and monitoring system of coastal zone activities; • Provide extension support for Fisheries Committees; and • Identify training needs and appropriate institutes to replace existing donor projects. 	<ul style="list-style-type: none"> • Coastal zone management training including participatory co management through the SAM / APC process; • Attending international forums; • Systems developed to monitor management (environmental impact assessments); • MoUs in place with other agencies including coastguard & armed forces and CFHC; • Training compliance officers (Planning Officers) & design of standard operating procedures; and • Acquiring compliance equipment.
3. Delegated implementation		
SAM coordinating advisory committees	<ul style="list-style-type: none"> • Providing advice in the development of the CZM policy; • Provide support for the co management processes undertaken by stakeholders in the SAM process; and • Support the development of Voluntary code of conduct systems for SAMs / APCs. 	<ul style="list-style-type: none"> • Training in compliance issues; • Awareness training in co management; and • Local compliance equipment provided.
4. Research, education & extension agencies		
National Aquatic Resources Research and development Agency (NARA)	<ul style="list-style-type: none"> • Provide information through bathymetric surveys and GIS mapping; • Provide information on the impacts of natural and human activities on coastal zone (corals, mangroves etc); • Provide advice on technical conservation measures; and • Provide support for extension. 	<ul style="list-style-type: none"> • Resource monitors trained; • Analytical equipment provided; and • Attending international forums.
Training organisations	<ul style="list-style-type: none"> • Conduct courses of study and training programmes in CZM policy & compliance. 	<ul style="list-style-type: none"> • Strengthening of commitment to supporting technical officers (CCD) and stakeholders.