



ASSOCIATION OF
SOUTHEAST ASIAN NATIONS



SOUTHEAST ASIAN FISHERIES
DEVELOPMENT CENTER

REGIONAL GUIDELINES FOR RESPONSIBLE FISHERIES IN SOUTHEAST ASIA
**SUPPLEMENTARY GUIDELINES ON CO-MANAGEMENT
USING GROUP USER RIGHTS, FISHERY STATISTICS,
INDICATORS AND FISHERIES REFUGIA**

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PREPARATION AND DISTRIBUTION OF THIS DOCUMENT

Supplementary Guidelines on Co-management using Group User Rights, Fishery Statistics, Indicators and Fisheries Refugia, was prepared by the Secretariat of the Southeast Asian Fisheries Development Center (SEAFDEC), in collaboration with Member Countries of the Association of Southeast Asian Nations (ASEAN). The Document is distributed to the ASEAN-SEAFDEC Member Countries, SEAFDEC Departments and concerned institutions.

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PREFACE

This book, as the title implies, are supplementary guidelines to substantiate the earlier publication of SEAFDEC – the Regional Guidelines for Responsible Fisheries in Southeast Asia: Responsible Fisheries Management, one of the four books which developed through the implementation of the program on the “Regionalization of the Code of Conduct for Responsible Fisheries (RCCRF) in Southeast Asia” in close collaboration with ASEAN-SEAFDEC Member Countries since 1998. It is intended to support the ASEAN-SEAFDEC Member Countries, especially providing regionally agreed technical suggestions on the various issues related to innovative fishery management scheme, to the staff who may need clarification on their activities in achieving sustainable fisheries in respective ASEAN Member Countries.

The book presents the guidelines into four subdivisions: Co-management Using Group User Rights for Small-scale Fisheries; Use of Indicators for the Sustainable Development and Management of Capture Fisheries; Fishery Statistics for Capture Fisheries; and Use of Fisheries Refugia for Capture Fisheries Management. The first three issues are the results of the programs implemented by SEAFDEC, as identified among the priority issues stipulated in the Resolution and Plan of Action of the Millennium Conference held in 2001, while the guidelines for the Use of Fisheries Refugia for Capture Fisheries Management is a concept developed through the project “Reversing Environmental Degradation Trends in South China Sea and Gulf of Thailand” implemented by UNEP-GEF. Though each of the Guidelines has its own introductory parts, efforts are made to summarize the information for the user’s of this book.

The Guidelines on “Co-management Using Group User Rights for Small-scale Fisheries” was developed under the Special 5-year Program on Sustainable Fisheries for Food Security in the ASEAN Region: Towards Decentralized Management of Sustainable Fisheries. It is based on innovative concepts and approaches, rights-based fisheries and co-management, through series of consultation process with the member countries. This part elaborates the delegation of fisheries management authorities on coastal fisheries to local fisheries organization, which may encourage small-scale fishers to take part of management action under the government policy and guidelines.

The Guidelines on “Fishery Statistics for Capture Fisheries” as included here is derived from the outcomes of regional/national consultations and project implemented by SEAFDEC since 2002 under the Special 5-year Program on Sustainable Fisheries for Food Security in the ASEAN Region, which includes the “Improvement of Fishery Statistical Systems and Mechanisms”. Its development started at a Core-Expert meeting in 2004, and was concluded after the ASEAN-SEAFDEC Regional Technical Consultation in 2005. The Guidelines has six sections: General Principles, National Fishery Statistical System, Capacity Building for National Fishery Statistical System, National Inter-Agency Coordination, Collaboration among ASEAN Member Countries and International/Regional Organizations, and Follow-up Actions.

The Guidelines on “Use of Indicators for the Sustainable Development and Management of Capture Fisheries” which is to large extent related to fishery statistics, was developed to complement the programs on statistics, thus, incorporating appropriate mechanisms for collecting data information supporting indicators in routine (fishery statistics) and non-routine exercises (research). It was supplemented by selected experiences from the pilot projects of member countries to clarify its potential application. The Guidelines explains the use of fishery indicators in the management of fisheries and stressed for the regional common understanding of the term, importance and roles of stakeholders, its development, and appropriate national system to support the scheme.

The Guidelines on “Fisheries Refugia” has been developed by UNEP-GEF through its Fisheries Component project entitled “Reversing Environmental Degradation Trends in South China Sea and Gulf of Thailand” in collaboration with SEAFDEC, wherein, implementation was conducted in its five ASEAN Member Countries. The Guidelines contains topics on the emergence of Fisheries Refugia, Regional Common Understanding which includes its definition, and others such as establishment, comparison with MPA as well as complementary initiatives in regional fisheries management.

However, as each national situation, considering various specificities including existing system and status of fisheries, social and economic situation and government policy on the way to support system varies from country to country, it should be recommended to conduct the appropriate works to nationalize the issues contained in the guidelines to develop the most practical national system in each country using the guidelines. The organization of National Consultation Meetings inviting appropriate stakeholders and nationalize the guidelines initiating the translation of the relevant issues to national language can be the suggested action to further promote the issues identified in the Code of Conduct for Responsible Fisheries.

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Part A

REGIONAL GUIDELINES FOR CO-MANAGEMENT USING GROUP USER RIGHTS FOR SMALL-SCALE FISHERIES IN SOUTHEAST ASIA

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REGIONAL GUIDELINES FOR CO-MANAGEMENT USING GROUP USER RIGHTS FOR SMALL-SCALE FISHERIES IN SOUTHEAST ASIA

Background

Over exploitation of limited fisheries resources coupled with excessive fishing capacity, use of destructive fishing gears and practices, conflicts of various users' interests and lack of appropriate regulatory system for fisheries are key contributors to drastic deterioration of fisheries resources. These situations have also provided impacts on the aggravation of poverty for the small-scale fisheries both in inland and inshore waters. Government officers including policy makers have, over the years, been concerned on manners and extent of the current utilization of fisheries resources and have called for urgent actions to rectify fisheries practices toward sustainable development goals and the improvement of management practices.

In line with the concept and principle set forth in the 1995 Code of Conduct for Responsible Fisheries (CCRF), SEAFDEC initiated regionalization as a process in 1998 to internalize the CCRF into actions with the special focus on the regional fisheries context. As a result of this process from 1998 to 2005, four sets of regional guidelines for responsible fisheries in Southeast Asia were developed through a series of consultation at national and regional levels. The four sets of guidelines deal with fishing operations, aquaculture, fisheries management and post-harvest practices and trade.

As a follow up to the above regionalization of the CCRF, the ASEAN- SEAFDEC Member Countries organized a Conference on Sustainable Fisheries for Food Security in the New Millennium: "Fish for the People" in 2001. The Conference identified important fisheries issues and formulated a regional fisheries policy framework and priority actions to achieve sustainable fisheries, which was adopted as ***"the Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region"***. With regards to aspects related to fisheries management, the Resolution and Plan of Action stress the need to develop an innovative fisheries management by incorporating decentralization of appropriate fisheries management functions to the local level, introduction of rights-based fisheries management through licensing and community fishing rights, and development of supporting legal and institutional frameworks under the co-management system.

Since then, the SEAFDEC Secretariat in collaboration with the Member Countries in the region, has clarified and introduced the concepts of rights-based and co-management in fisheries focusing on small-scale fisheries. It is also highlighted through the technical clarification exercises that the development of local institutions building exercises is the key element for the effective implementation of the co-management system. It is important to note that the establishment of local institutions will provide solid basis not only for the improved management practices, but also for systematic

government assistance and supports for their livelihood. It was also found that such national network among local fishing communities would provide positive effects on poverty alleviation, both at normal and emergency circumstances such as rehabilitation works from Tsunami damages.

To facilitate further development of these concepts, the SEAFDEC Secretariat, through the “*Toward Decentralized Management for Sustainable Fisheries in the ASEAN Region (2002-2005)*” project under Special 5-year Program, developed “the Regional Guidelines for Co-management Using Group User Rights for Small-scale Fisheries in the ASEAN Member Countries”, through a series of regional consultations. The guidelines are expected to support the national efforts in improving management of small-scale fisheries.

Rationale for Managing Small-scale Fisheries through Co-management Approach Using Group User Rights

In the ASEAN context, small-scale fisheries either involved as full-time or part-time, both in inland and inshore waters constitute the major part of the sector. Considering its contributions to local food security, sustainable livelihoods and poverty alleviation, and the fact that small-scale fisheries are generally a weak sub-sector in terms of financial and technical capabilities, the comprehensive supports from the government are perceived as inevitable and required factors to maintain social and economic securities in the rural areas.

It is also important to note that inshore waters and some inland water areas, where small-scale fisheries are operating, are often considered as critical habitats for commercially important aquatic resources (being spawning, nursery or feeding grounds) and for tropical unique ecosystem as a whole (specifically referred as coral reefs, mangrove forest and sea grass beds). It is therefore crucial to develop appropriate fisheries management system and conservation mechanisms of these fragile coastal ecosystems.

It is understood that any innovative fisheries management methodology will not be effectively implemented, as far as the fishing operation is conducted under the current unregulated and “open access” manner. The introduction of rights-based fisheries has therefore been considered as a crucial factor for the effective implementation of the innovative management. In view of developing and improving the management of small-scale fisheries, “group user rights” are considered as appropriate right-based fisheries to be promoted under co-management system.

By adopting “group user rights”, ownership and partnership of small-scale fisheries in management of resource utilization could be enhanced. If the management needs are fully shared among resource users, the compliance level of the regulations in achieving the sustainable fisheries will be greatly improved.

Regional Understanding on Key Terminologies¹

As a basis for common understanding on the key terminologies used in this Guidelines, explanation on the following terminologies are provided.

Small-scale Fisheries² - is broadly characterized as a dynamic and evolving sector employing labour-intensive harvesting, processing and distribution technologies to exploit marine and inland water fishery resources. The activities of this sub-sector, conducted full- or part-time, or just seasonally, are often targeted on supplying fish and fishery products to local and domestic markets, and for subsistence consumption. In the context of coastal fisheries in the ASEAN region, the definition of small-scale fisheries is different from country to country due to legal implication of the term and applied systems of demarcation from that of commercial fisheries³.

Rights-based Fisheries - Fisheries where the right to fish or utilize the fisheries resources is licensed or permitted by the competent government authority, giving the licensed fishers access and use rights to the fishing ground. Such rights are accompanied by obligations to comply with the rules and regulations of the right-based regime.

Fishing Rights - A kind of right, by which fishers may have exclusive use for a designated area and resources. It is an authorization given to fishing communities to enable them to do fishing.

Co-management - An approach to management in which the government share certain authority, responsibilities and functions of managing the fisheries with resource users as partners.

Geographical Division of Administrative Unit /Government Structure of the Country - In order to ensure better understandings of the Guidelines under diversified administrative unit /government structure of the countries, the following generalized terminologies will be used.

- 1) Central level** : Any administrative orders, legal instruments and required actions including policy framework to be initiated by the central offices (located in capital city) of the government. The effectiveness of these initiatives should be consistent in nation-wide (national level).
- 2) Local level** : Any administrative orders, legal instruments and required actions including policy framework to be initiated by the local government offices (There might be different choices of the involvement of the local government by the countries; Provincial, District, Regional, Municipal, State etc.).

¹ From the Regional Guidelines for Responsible Fisheries in Southeast Asia: Fisheries Management

² Adapted from the FAO Advisory Committee on Fisheries Research, Report of the Second Session of the Working Party on Small-scale Fisheries, Bangkok, Thailand, 18–21 November 2003, *FAO Fisheries Report No. 735*.

³ Refers to Regional Guidelines for Responsible Fisheries in Southeast Asia: Fisheries Management

Community Fisheries Management Organizations (CFMOs) – The guidelines propose the establishment of the Stakeholders (fishers) institutions in each designated area. Roles and functions of CFMOs should be nationally designed and guided by appropriate national framework. The name was selected only for better understanding of the guidelines. The respective countries will appropriately choose the specific name of the organizations when it is implemented.

Community Fisheries Management Committee (CFMC) – The guidelines propose the establishment of a co-management mechanism in community level as a main function of CFMOs. The name was selected only for better understanding of the guidelines. The respective countries will appropriately choose the specific name of organization, when it is implemented.

Scope, Structure and Potential Usage of the Guidelines

The Guidelines consist of the following ten sections. – I. General Principle, II. Scope and Characteristics of Co-management, III. Fishing Rights IV. Designated Areas for Fishing/Aquaculture under Fishing Rights, V. Supporting Legal Frameworks for Co-management Using Group User Rights, VI. Community Fisheries Management Mechanism VII. Institution Building of the Community Fisheries Management Organizations (CFMOs), VIII The Membership of CFMOs. IX Financial Sustainability of CFMOs and X. Conflict Settlement and Enforcement.

The Guidelines are considered as supplementary directives to the Regional Guidelines for Responsible Fisheries in Southeast Asia: Fisheries Management. They are intended to provide a regional reference or checklist for countries that are interested in implementing and improving the management of their small-scale fisheries (co-management approach) using group user rights. It should be noted that the Guidelines, in their nature, generalize issues in the broader context of regional fisheries rather than focusing on specific national situation. It is therefore suggested that the actual application of the Guidelines would require appropriate adjustment or modification, including the terminology used in the guideline so as to fit the national or local specifics on social, economic and legal situations.

I. General Principle

1.1 National Policy on Co-management of Small-Scale Fisheries Using Group User Rights

1. As an initial step, an appropriate national policy on co-management of small-scale fisheries should be formulated. The national policy should clarify responsible local institutions and delegation of management functions/responsibilities to the local levels. The additional policy with respect to the group user rights for the specific target group can be developed under co-management approach, if the introduction of regulated entry system (right based fisheries for small scale fisheries) is considered

as an important element for the development of innovative fisheries management. The policy should be coupled with appropriate awareness building activities to ensure understanding among stakeholders concerned and facilitate the implementation of the co-management.

1.2 Regulated Entry for Exploitation of the Common Fisheries Resources

2. While noting that fisheries of most countries in the region are conducted under the “open-access” regime, it is generally understood that the “open-access” is probably the major cause for the excessive exploitation of fisheries resources. In contrast, a “regulated entry”, even under the “open access” regime, provides access to fisheries resources with the condition that relevant rules and regulations are observed. The appropriate policy for setting up a “regulated entry” is therefore important as an initial step.

3. Once a policy of the “regulated entry” is considered as a step to proceed, it is then an issue of identifying and selecting an appropriate number of fishers who will be allowed to fish should be carefully considered. The identification and selection process should be conducted in a transparent manner through consultation and consensus building among stakeholders. This process should not only facilitate the implementation of regulated entry system but also should provide an exit scheme in case some fishers may have to leave the sector. To support this process, awareness building to ensure that there is a common understanding of the needs for “regulated entry” system by the stakeholders involved, irrespective of their nature, is crucially important.

1.3 Target Beneficiaries of Co-Management under Regulated Entry System and Coordination with Other Fisheries Sub-Sectors

4. The guidelines address the co-management system, using regulated entry, especially group user rights system. The application of the system provided in the guidelines targets small-scale fisheries/aquaculture in inland and inshore areas.

5. As fishers involved in commercial fisheries are possibly under different management schemes such as license and operating in different fishing grounds, may live in the same communities and share the same facilities such as mooring sites, a close coordination between these two sub-sectors should be developed.

6. Delineation exercises on usage patterns of fishing ground (through appropriate zoning or other clarification) of these different sub-sectors should be carried-out to coordinate their activities in the same and adjacent geographic areas. The same principle is applied to the coordination between small-scale fisheries and aquaculture (i.e. cage culture) in view of the appropriate usage of the areas.

7. Considering the expansion of sport or recreational fishing in inland and coastal waters, this type of fishing should not be excluded from the responsibility of co-management. Some rules to regulate or monitor the expansion of sports fishing,

especially for those using boats and engines may be required under the co-management system using group user rights. However, the people involved in this type of fishing should not be considered as target beneficiaries of this rights-based fisheries system.

1.4 Interactions between Small-scale Fisheries and Other Sectors in Local and National Economies

8. As populations and economies grow, aquatic ecosystems will come under increased pressure, it is important to recognize the social and economic dimensions of small-scale fisheries in broader national social and economic development. This is particularly true for the participation of small-scale fisheries in planning decisions within multiple resource uses among various sectors. A greater awareness among the fishers on these requirements should be enhanced to achieve better balance or harmonization with competing resource uses.

II. Scope and Characteristics of Co-management

2.1 Concept and Scope of Co-management

9. Co-management is an approach for the management in which the government share a certain part of its authority, responsibilities and functions in managing the fisheries with resource users as partners. Considering the limited capacity of the central government to appropriately manage the fisheries at various specific localities for the entire country, it is more effective if certain management functions and responsibilities are delegated to the local government at appropriate level through a decentralized process. However, these offices are normally not well equipped with technical and financial capabilities for fisheries management. The local government should therefore work in partnership with resource user institutions at the community level to share these management functions and responsibilities and to mobilize local knowledge.

10. Where there is no existing resource user organization in place at the local/community level, appropriate organizations working on behalf of resource users should be established. The establishment process should involve all concerned stakeholders in a participatory approach and receive appropriate supports including initial investment from relevant government agencies. However, considering the special privileges that fishing right is given to such organizations under the “open access” regime, clear government policy and guidelines on the role, function and structure of such community organizations in transparent manner are required.

11. Under the co-management concept, the delegation of appropriate management functions and authorities to the appropriate local level within the government structure should be conducted. This can be considered as a partner for the co-management from the government side. However, central government itself can also act as a partner of co-management, if appropriate arrangements are developed.

A Community Fisheries Management Organizations (CFMOs) as a partner of co-management system on behalf of the resource users, should therefore be established, following the basic frame set in place by the central government for the development of such community organizations.

12. It is envisaged to delegate the responsibilities and appropriate day to day management actions and functions on fisheries management to such community organizations through appropriate policy development. It is also very important to enhance the awareness and local consensus of the co-management system among people who are either inside or outside of such system. The government intervention on the fisheries management under the co-management can be limited to the provision of framework (legal and policy) and required technical assistance in practical level, once the delegation of day to day management actions and responsibilities to CFMOs is conducted.

2.2 Roles of Parties Concerned in Co-management

2.2.1 *Government Agencies*

a) Central Government Agency

13. The central government agency should provide the national co-management framework and an enabling environment for the effective implementation of the system. An appropriate policy should first be established at the national level together with various guidelines for implementation at the local level.

14. The national co-management framework, to be developed through a practical and transparent consultation process with the concerned stakeholders, should also include basic terms of reference for all identified partners with respect to fisheries management and other required services. The appropriate legal provisions, including the delegation of fisheries management functions and responsibilities to local government and community organizations should also be clarified. The central government will provide appropriate services to the system through close monitoring of the progress of the delegated management activities to the local level. The required services will include the coordination with other sectors, various technical assistance as well as financial assistance, if required. Institutional building for resource users at community level to empower them to be involved in co-management is crucially important. Policy and legal framework on regulated entry, especially on group user right should be appropriately developed by the central responsible agency.

15. The central government agency should, where and when required, intervenes in solving fisheries management issues that are beyond the capability and scope of the partners at the local level, such as conflicts and problems among fishers from different local areas or with fishers from other countries.

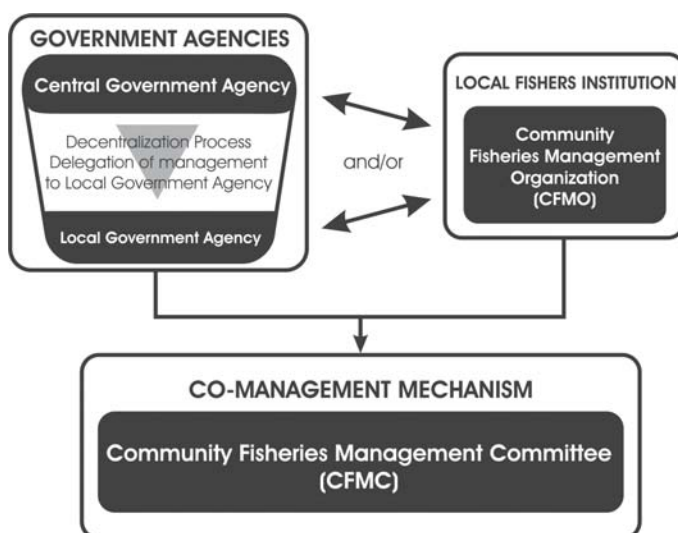


Figure 1. Fisheries Co-management Mechanism: linkage between central government agency, local government agency and Community Fisheries Management Organization

b) Local Government Agencies

16. Local government agencies (Provincial, District, State, Regional, Municipal as appropriately be defined by the country) should provide local co-management frameworks (including regulations of the co-management with appropriate focus given to the local specificity) and coordination of the practical usage of fisheries resources or water surface areas (monitoring the appropriateness of the allocated designated areas for individual CFMOs). Local government agencies should coordinate respective management actions including the appropriate interventions to solve the management conflicts among CFMOs within their jurisdictional area. The agencies should also monitor fisheries management activities and periodically report to the central government for their further coordination and proposals for the areas of improvement.

2.2.2 Resource User Organizations at Community Level

17. Community-Fisheries Management Organizations (CFMOs) is a resource user organizations that should be established to conduct day-to-day fisheries management actions under the national and local co-management frameworks and existing fisheries regulations. With technical assistance from the central and local government agencies, CFMOs should develop their fisheries management plans and organizational operation plans including economic activities to appropriately conduct the required activities. It is also suggested that coordination among CFMOs as well as between CFMOs and existing community administrative structures, which are generally multi-sectoral bodies should be promoted to facilitate more effective operation of individual CFMOs.

18. The co-management partners from the government side such as national and/or local government agencies may periodically review the terms of reference of CFMOs based on the evaluation of their performance. Some modifications including the merging and/or division of the CFMOs can be introduced in accordance with the development activities, economic viability and financial feasibility considerations.

III. Fishing Rights

3.1 Types of Fishing Rights (Group User Rights) and their Characteristics

19. Group user rights is an exclusive access rights to fisheries resources and use of water surface in case of aquaculture to be given to the resource users within a manageable designated area through the appropriate local organization, Community Fisheries Management Organization (CFMO), not to individuals. Under such arrangement, only the members of CFMO can have privileges to fish in the designated areas with obligation to manage their fisheries and aquatic environment in sustainable manners as set by the national/local policy and legal frameworks.

20. Rights-based fisheries using group user rights systems should take in full consideration of the other existing systems such as traditional social/ management system in the communities. It is also very important to possibly seek local consensus on the system to be introduced with these systems and people who have been traditionally related to the fisheries in indirect manners including market, post-harvest sub-sectors.

3.2 Exclusiveness of Fishing Rights

21. Fishing rights (group user rights) should maintain the concept of exclusiveness for the exploitation of fisheries resources or for the use of water surface areas in the designated areas.

3.3 Transferability of Fishing Rights

22. The right will not be transferable unless agreed upon in consensus by the local government agencies and the concerned CFMO which are responsible for the co-management mechanism. The same concept is applied when terminating fishing rights and modification of scope and functions of the CFMO (i.e. in case of infeasibility of the independent operation of CFMO due to reasons including resources deterioration.).

3.4 Privileges of Fishing Rights

23. The individual fishers and aquaculture farmers, who are the members of CFMO, will enjoy the following privileges being the members of CFMO.

- 1) Exploitation of the identified fisheries resources by using appropriate fishing gear and methods and during the appropriate fishing seasons, or
- 2) Usage of defined water surface areas for aquaculture activities.

As fishing rights is not a kind of property right over fisheries resources or water areas, the rights could not be used as collateral or used for other similar transactions. However, it should be noted that these privileges should be accompanied with the various obligations to sustain the fisheries/aquaculture in the designated area.

24. In case the fishing rights is violated by external factors including pollution and other interventions that might affect the normal usage of the rights, compensation scheme to be charged to the violators should be designed and applied.

IV. Designated Areas for Fishing and Aquaculture Activities under the Fishing Rights

25. All areas where fishing and aquaculture will be conducted both in inland and inshore waters should be first divided into appropriate geographical local administrative division (such as Province, District, State, Region, Municipality as appropriately conceived by country). The width of the area (appropriate distance from shoreline toward off shore) should be decided taking into account factors including the current usage pattern of the water by small-scale fishers and fish farmers and the capabilities of CFMOs that can effectively managed (e.g. it could be envisaged as not more than 3 miles from the shore, but actual width will be decided in each localities of the country). The length of areas can be equivalent to the range of geographic local division accorded with division's boundary.

26. A designated area may cover more than the boundary of one fishing community if communities of these areas are sharing resources in a particular ecosystem. However, this arrangement should be set up by consensus among the concerned resource users and government agencies.

27. Within the local geographical administrative division, the individual designated area should be further designed and allocated to each established CFMO as basis of fishing right (group user rights) taking into account the following factors:

- a) Current community boundaries (geographical, legal and administrative point of views);
- b) Current fishing areas and resources utilization pattern of the community;
- c) The width of the designated areas should be consistent with the one of geographic local division, as far as practical;

- d) Local capability to effectively manage the fisheries including enforcement of the rule and regulation; and
- e) Viability of the economic activities that ensure sustainable operation of CFMO. The size of areas together with the potential numbers of members in the areas will determine the success factor of sustainable operation of CFMO (not too large but not too small).

V. Supporting Legal Frameworks for Co-management Using Group User Rights

5.1 Legal Framework at National Level

28. The national legal framework for co-management using group user rights of small scale fisheries should make cross reference with existing national fisheries and other relevant legislation in the use of water, fisheries resources. Supporting legal framework should include (i) the identification and delegation of fisheries management functions and responsibilities to local government and CFMOs as partners of co-management including the legal roles and functions of Community Fisheries Management Committee (CFMC) (as discussed in 6.1), (ii) legal provision for the group user rights (fishing rights) and (iii) legal provision for the establishment of CFMOs (legal basis for institutional building of CFMOs, and clarification and framework of the required supporting economic activities).

29. The legal framework at national level should also clarify/define the designated areas especially for the establishment of local division's water (legal basis for designated fishing areas for the management of CFMO. However, legal designing work of each designated area can be more appropriately conducted at the appropriate local level rather than national level).

5.2 Legal Framework at the Local (Local Government Agency) Level

30. The local legal framework for using group user rights in co-management of small scale fisheries should make cross reference with existing local fisheries and other relevant legislation in the use of water, fisheries resources. Appropriate local regulations for co-management supported by the central government should be formulated in consultation with the fishing communities or CFMOs and central government in order to coordinate required management measures within the national framework. Such local legal framework should include the detailed roles and functions of CFMC. The regulations may cover the geographical areas of each exclusive designated area, the definition of right coverage (type of fishing gears and methods), roles and responsibilities of resource users, rules for the operation of CFMOs and the guidelines for supporting social and economic activities to be conducted by each CFMO. This local legal framework should be subject to a mandatory review on a regular basis and appropriately revised reflecting development and changes in local fisheries requirements and other evolving critical issues.

5.3 Legal Framework at Community Level

31. The national and local legal frameworks and its contents should empower the CFMOs on their day-to-day fisheries management actions and enable them to enforce the required management measures through the effective operation of CFMC. Community Fisheries Management Committee (CFMC) will further develop their own by-law based on the specific local situations, with the support of central and local governments.

VI. Fisheries Co-management Mechanism

32. Appropriate fisheries management mechanism should be developed in conjunction with the institutional building exercises of Community-Fisheries Management Organizations (CFMOs). The participatory mechanism as a tool of co-management should be developed along line with the legal provisions at both central and local levels

6.1 Community Fisheries Management Committee (CFMC)

33. A Community-Fisheries Management Committee (CFMC) is a structure to manage fisheries at community level and which performs as the decision making body for the Community Fisheries Management Organization (CFMO) for the designated area. The Committee is composed of the representatives from the members of CFMO and relevant government agency (It may not be necessary for the representatives from government agency to participate the Committee in all the times, if appropriate empowerment arrangements together with legal and policy framework for the local institutions to manage their fisheries has been clarified and provided), and should be meet periodically/regularly to decide on matters including the following:

- a) Formulation of agreed rules and regulations (by- law) for their day-to-day operations for fisheries management and other social and economic activities in conformity with the national and local legal frameworks;
- b) Formulation of agreed compensation scheme and penalties for violators;
- c) Involvement of the final allocation of the designated areas (only at the first time);
- d) Monitoring of appropriate usage of water surface of the designated areas for stationary fishing gear (such as set-net or fish aggregating devices), resource enhancement (such as artificial reefs, marine protected areas or refugia, if required) and aquaculture facilities and other fisheries structures that may affect on navigation or impact the marine eco-system;
- e) Methods of exploitation of fisheries resources including appropriate fishing gear and practices;
- f) Operation practices including the enforcement of the fishing season including closed season and closed area for particular species;
- g) Implementation of environmental conservation measures and activities such as habitat (coral reef and mangrove) protection and rehabilitation;

- h) Exit and new entry of CFMO members;
- i) Clarification of the responsibilities and privileges of various categories of membership;
- j) Conduct regular monitoring of the status and trend of fisheries and aquaculture;
- k) Local settlement of the conflict among members and appropriate penalty for the violators of the rules;
- l) Review and approve fisheries management plan based on the status of fisheries and aquaculture as well as CFMO operation plan;
- m) Development program for fisheries including proposals looking for government assistance such as demonstration of appropriate fishing practices and resource enhancement program and development of the required infrastructure facilities; and
- n) Supervision of CFMO economic activities and financial management;

34. The staff locally recruited by CFMO should act as the Secretariat of the Committee and other required meetings of CFMO in consultation with its members.

VII. Institution Building of the Community Fisheries Management Organizations (CFMOs)

35. Community Fisheries Management Organizations (CFMOs) should be established preferably in each designated area based on the national consisted policy and legal provision.

36. As the exclusive fishing rights (group user rights) in the designated areas should be given to each CFMO, only the members of the CFMO are granted privileges of conducting appropriate fishing/aquaculture activities in the designated area. Major activities of CFMOs include:

- a) Support of the implementation of management and operation plan developed by CFMC;
- b) Conduct of economic activities of CFMO to be financially sustainable/viable;
- c) Organization of CFMC in collaboration with its members;
- d) Awareness/capacity building for members and non- members for the objectives and operation of the CFMO;
- e) Develop, conduct and update appropriate and simple registry system to keep records of CFMO members and activities. Such information includes the of members and their families, type and number of boats and fishing gear used and aquaculture facilities. In addition, CFMOs could also act as the smallest/lowest unit of the collection point of national statistical information; and
- f) Conduct financial management and book keeping.

37. CFMOs should be equipped with an appropriate number of staff recruited or assigned, based on agreed conditions (term of reference, time required, salary and other benefits) set by the concerned CFMC. The staff locally recruited by CFMO should conduct the above activities in collaboration with its Members.

VIII. The Membership of CFMOs

8.1 Selection Criteria of CFMO Members

38. As only CFMO members are granted access rights to use fisheries resources and surface areas for aquaculture in the designated area, the eligibility of its members has to be carefully justified. To avoid social conflicts that may be caused by establishment of a CFMO, initial members of CFMO may include community members who have been using fisheries resources in the designated area. However, a certain number of members may gradually be diminished through the community efforts to identify alternative livelihoods for the people who may find difficulties to continue fisheries and aquaculture.

39. Considering the current over capacity status in fisheries, freezing and then decreasing the number of fishing units in the community should be seriously considered. Therefore, an appropriate system to periodically review the performance of members to regulate number of CFMO members should be developed.

40. The member selection criteria to be decided through consensus should start with the evaluation of the existing users of fisheries resources and surface areas for aquaculture in the designated area, before the CFMO is established. Although the existing fishers and fish farmers are the priority candidates for CFMO members, the dependency level of the candidates on fisheries could be the most important criteria for the selection of the CFMO members. The following criteria/evaluation are the areas for consideration:

- a) Dependency level on fisheries – appropriate number of days fishers/fish farmers involved in fisheries and aquaculture could be set to indicate whether they are full-time or part-time fishers. This will help provide a basis for development of different categories of membership; Actual criteria of full-time/part time should be developed by country and type of fisheries (marine/freshwater);
- b) Residence in the community area;
- c) Technical capacity to conduct responsible fisheries and/or aquaculture;
- d) Capacity to comply with the rules and regulation set by the CFMO; and
- e) Current users of fisheries resources in the designated area.

41. The members of CFMOs may prefer to reduce the number of its membership under the group user right system. This could be considered as an effective local mechanism to alleviate the over-capacity situation for the small-scale fisheries and additional benefit of the introduction of group user rights.

42. It may be necessary to consider allocation of the “Secondary Membership” in some areas, when such group user right is first introduced, as a temporary/exceptional measure. The Secondary membership can be provided to the people who have been traditionally using the resources in the designated areas, but not living in the same community. Appropriate conditions should be developed for such membership including practical compensation /management costs to be charged to the Secondary Membership, if the applicants are not practically involved in the management actions including the operation of CFMC. Other category of the “Secondary Membership” through CFMC covering the part-time fishers in the community also has to be clarified.

8.2 Responsibilities of the CFMO Members

43. With the membership given by a CFMO, members are obliged to accept the following responsibilities :

- a) Abide to rules and regulations set by the CFMO;
- b) Accept the required collaborative work for the implementation of CFMO activities agreed by the CFMC; and
- c) Provide all required information with respect to their activities and production that can be used for the CFMO’s administration as well as the basis for the national fisheries statistics.

IX. Financial Sustainability of CFMOs

44. It is very important factor whether CFMOs are, in principle, financially sustainable and independent from the government financial support. In order to sustain operation of CFMOs, the following economic activities could be developed with the appropriate government promotional work, policy, legal and technical support. and should be conducted by the CFMO staff in collaboration with its members.

- a) Public auction at the community for the sale of the member’s catch, and
- b) Bulk purchase of the required goods (fishing gears, engines and other equipment and basic consumable items for the use of the members). The bulk purchase can economize the costs compared with individual purchase by respective fishers.

45. Based on the national framework (legal provision) of the economic activities of the CFMOs the commission (appropriate percentages of the handling cost) of above two activities should be composed of the main source of income of CFMOs. In addition to these basic economic activities, other economic activities such as community aquaculture or post-harvest business can be developed based on the agreement of CFMC. Other source of income to CFMOs can be the membership fee. A saving - revolving fund can be established for the members of CFMO with the transparency financial management, in order to strengthen economic activities of the organization and expanding the access to capital and improving economic situation of members’ household.

46. CFMOs should have capability of financial management for its economic activities including bookkeeping. The CFMC should conduct the financial management including auditing exercise of the CFMO.

X. Conflict Settlement and Enforcement

47. Internal conflicts and violation of rules among members can be settled through internal mechanism such as CFMC. The CFMC should develop an appropriate *modus operandi* for the rules set for fisheries management including conflict settlement among the members.

48. With the enhanced ownership of the designated areas and privileges to exploit the fisheries resources, it is envisaged that the members themselves will be more responsible for their daily fishing activities and be more concerned for other people's activities. Such enhanced concerns on the use of fisheries resources in responsible manner may initiate to act as informants for the cases of violation of the rules and regulations set by CFMOs and other local authorities.

49. Conflicts as well as non-compliance against rules set by the CFMOs by the non-members (either living in the communities or outside) or other sub-sectors including large-scale commercial fisheries will be settled with the interventions of the appropriate local government agencies through their existing services (fisheries inspection officer, local authority, police or mobilizing coast guards). CFMOs and their members could assist in alerting the concerned co-management mechanism (CFMC) and/or directly to local government agencies.



ASSOCIATION OF
SOUTHEAST ASIAN NATIONS



SOUTHEAST ASIAN FISHERIES
DEVELOPMENT CENTER

Part B

REGIONAL GUIDELINES FOR FISHERY STATISTICS FOR CAPTURE FISHERIES IN SOUTHEAST ASIA

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REGIONAL GUIDELINES FOR FISHERY STATISTICS FOR CAPTURE FISHERIES IN SOUTHEAST ASIA

CHAPTER I

INTRODUCTION

Background and Rationale

Knowledge of the status and trends of fisheries, not only in terms of fishery resources but socio-economic aspects, is a key to sound policy-making and responsible fisheries management. Information on the status and trends of fisheries, obtained through routine data collection (fishery statistics) and non-routine data collection (research), is therefore essential for assessing the validity of fisheries policy and for tracking the performance of fisheries management.

Fishery statistics is widely accepted as a tool to provide a basis and being crucial to the determination of national fisheries policies, the formulation of national management frameworks and actions or even as a basis for understanding the status and condition of fisheries resources. However, current national fishery statistical systems of ASEAN Member Countries are not effectively implemented. More accurate and timely statistics should result in a better informed public that supports efforts to manage fisheries in a responsible manner. The need for timely and reliable statistical data for the formulation and evaluation of fishery programs and policies has inevitable expanded manifold for development and management purpose.

Based on the Code of Conduct for Responsible Fisheries (CCRF) adopted in 1995, efforts by countries in Southeast Asia have been made in rectifying their fisheries practices towards responsible/sustainable principles. However, due to uniqueness of fisheries in the region, implementation of the CCRF has to accommodate regional priorities and specificities. This was strongly supported by the ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security in the New Millennium: “Fish for the People” held in 2001. The Conference adopted “Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region (RES&POA)”. The RES&POA is regarded as the regional fishery policy framework and priority actions to ensure sustainable development of fisheries in the region. The RES&POA concluded that there is a need to “Formulate regional guidelines to implement the Code of Conduct for Responsible Fisheries, taking into account the specific social, economics, cultural, ecological and institutional contexts and diversity of ASEAN fisheries.”

In line with this requirement, SEAFDEC has been promoting a regional collaborative program on “Regionalization of the Code of Conduct for Responsible Fisheries.” The program aims at translating the CCRF into actions accommodating regional priorities and uniqueness of fisheries. An important outcome of this on-going program is the development of Regional Guidelines for Responsible Fisheries in Southeast Asia: Responsible Fisheries Management, which has been endorsed by the high-level authorities of ASEAN and SEAFDEC for implementation.

Within the scope of fisheries management in the CCRF, the importance of quality statistics was stressed as a tool to facilitate development planning and management of fisheries. This has been echoed with a number of regional collaborative works in fisheries management in general and in fishery statistics and information in particular. Due to a large number of issues covered in the Regional Guidelines for Responsible Fisheries in Southeast Asia: Responsible Fisheries Management, the guidelines that address the issue related to fishery statistics were still broad and needed more elaboration. This is to enable the countries in the region to clarify a clear direction for actions to improve fishery statistics.

Preparation of the Regional Guidelines for Fishery Statistics

In response to the above requirement, SEAFDEC developed a Special 5-year Program on Sustainable Fisheries for Food Security (2002-2005). The program, which aims at supporting the ASEAN Member Countries to implement the RES&POA and regional guidelines for responsible fisheries, composes of projects on various issues related to fishery development and management. As an important element, the program includes the project on “Improvement of Fishery Statistical Systems and Mechanisms”.

Through a series of project activities and regional/national consultations on fishery statistics, it is proposed that regional guidelines for fishery statistics should be developed to substantiate issues related to fishery statistics as included in the Regional Guidelines for Responsible Fisheries in Southeast Asia: Responsible Fisheries Management focusing on Sub-article 7.4 and relevance sub-articles. It should be noted that guidelines on the use of indicators for fisheries development and management, which is to a large extent related to fishery statistics, is separately provided.

The Regional Guidelines for Fishery Statistics for Capture Fisheries in Southeast Asia was first developed at the Core Expert Meeting on Fishery Statistics, held from 20 to 23 December 2004; and further discussed at the FAO-SEAFDEC Regional Workshop on the Improvement of Fishery Data and Information Collection Systems held from 15 to 18 February 2005 in Bali, Indonesia. The Draft Regional Guidelines was finally discussed and finalized at the ASEAN-SEAFDEC Regional Technical Consultation on Fishery Statistics organized by the Secretariat and co-hosted by the Department of Fisheries, Thailand from 18 to 21 October 2005. After the final round of deliberation, review and revision, the representatives from the ASEAN-SEAFDEC Member Countries, ASEAN Secretariat, Food and Agriculture Organization of the United Nations, UNEP/GEF South China Sea project, as well as officials from SEAFDEC Secretariat, TD and MFRDMD agreed with the final Regional Guidelines for Fishery Statistics for Capture Fisheries in Southeast Asia, which is considered as a supplementary guideline to the Regional Guidelines for Responsible Fisheries in Southeast Asia: Responsible Fisheries Management.

The final draft will then be submitted to higher authorities of ASEAN and SEAFDEC for consideration and endorsement. As a follow-up, there should also be efforts made to further investigate the Regional Guidelines for Fishery Statistics for Aquaculture.

The Regional Guidelines for Fishery Statistics is envisaged to provide an important framework for formulation of ASEAN-SEAFDEC collaborative programs on fishery statistics as well as for supporting cooperation among the countries in Southeast Asia and international/regional organizations.

Structure, Purpose and Potential Usage of the Regional Guidelines

Each country and fishery is different and will need a different approach for collecting fishery statistics in response to differences in policy emphasis, preferred approaches, and differences in administrative structure, staffing and budget. Although, approaches and general methodologies may be similar in various countries in the region, it thus makes it impractical to formulate an implementation manual for fishery statistics applicable to all countries in the region.

Considering the nature of the Regional Guidelines for Fishery Statistics for Capture Fisheries in Southeast Asia, the Guidelines are not meant to be the implementation guidelines that are directly applicable to all ASEAN countries. They are rather intended to provide a regional reference or checklist for countries in the ASEAN region that are interested in reviewing and/or improving national fishery statistical systems. It should be noted that the Guidelines, in their nature, generalize issues in the broader context of regional fisheries rather than focusing on specific national situation. It is therefore suggested that the actual application of the Guidelines would require appropriate adjustment or modification, including the terminology used in the Guidelines so as to fit the national or local specifics on geo-political, social, economics and legal situations.

The Guidelines consist of the following six sections:

- I. General Principles
 - Policy and Institutional Framework
 - Integrating Statistics into Fishery Data and Information System
 - Participation and Cooperation of Stakeholders
 - Maximizing Fishery Statistics Usage
- II. National Fishery Statistical Systems
 - Defining Clear Objectives and Usage
 - Minimum Requirements
 - System Design and Review
 - Data Requirements
 - Data Collection Methodologies
 - Data Processing, Analysis, Reporting and Presentation
 - Use of Information Technology
- III. Capacity Building for National Fishery Statistical System
- IV. National Inter-agency Coordination
- V. Collaboration among ASEAN Member Countries and International/Regional Organizations
- VI. Follow-up actions

As a supplement to these Guidelines, “Handbook on Collecting Fishery Statistics for Inland and Coastal Fisheries” can be referred. The Handbook provides reference in the following three main parts:

- **Fishery Statistics and Statistical Design:** discussion of variables, indicators as well as statistics and sample survey design with guidelines to design a statistical system or review an existing one. It also contains recommendations for a minimal statistical system.
- **Data Collection Methods:** general methodologies available with a detailed discussion of the methodologies for catch assessment (catch and effort) and collecting appropriate economic data and livelihood (socio-economic) information as well as non-routine data collection including data collection in a co-management setting.
- **Approaches for Processing and Analysis:** GIS as a tool for survey planning, analysis and extrapolation, survey planning, data processing, training and a glossary with terms used in this document.

CHAPTER II

REGIONAL UNDERSTANDING ON KEY TERMINOLOGIES

As a basis for common understanding on the key terminologies used in these Guidelines, explanation on the following terminologies is provided below. It should be noted that regional understanding on the terminologies are mainly taken from the Regional Guidelines for Responsible Fisheries in Southeast Asia: Fisheries Management (SEAFDEC, 2003) as well as from the Handbook on Collecting Fishery Statistics for Inland and Coastal Fisheries (SEAFDEC, 2004). Regional understanding of terminologies taken from other sources will indicate otherwise. The key terminologies are as follows:

***Capture (or fishing)*¹** - An economic activity to catch or collect aquatic organisms which grow naturally in public waters and which do not belong to the property of any person. The collection of shells of molluscs is also included herein.

Census - A "complete enumeration" or count of certain variables for all members of a population. Fisheries census is collection of structural fisheries information using a census approach. The primary objective of fisheries censuses is to provide a detailed classification of the fisheries structure of the country. It provides estimates for each household, and therefore, aggregated data for the smallest administrative, political or statistical subdivisions of the country and for classifications of households by size or other subgroups of interest. The results of fisheries census are used as a frame for planning and conducting fishery-sampling surveys.

Co-management - An approach to management in which the government share certain authority, responsibility and function of managing the fisheries with resource users as partners.

Fisher - A person (male or female) participating in a fishery (in preference to the previously used term 'fisherman'). An individual who takes part in fishing conducted from a fishing boat, platform (whether fixed or floating) or from the shore.

Fishery – In general, a fishery is an activity leading to harvesting of fish. It may involve capture of wild fish or raising of fish through aquaculture.

Fisheries management - 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 govern fisheries activities in order to ensure the continued productivity of the resources and accomplishment of other fisheries objectives.

Fishing boat - Any vessel, boat, ship, or other craft that is used for, equipped to be used for, or of a type that is normally used for the exploitation of living aquatic resources or in support of such activity.

¹ Referred to the Explanatory Notes of the Fishery Statistical Bulletin for the South China Sea Area 2002, SEAFDEC.2005.

Household - A basic unit for socio-cultural and economic analysis. It includes all persons, kin and non-kin, who live in the same dwelling and share income, expenses and daily subsistence tasks.

Indicators² - An indicator is a pointer used to track changes in a fishery. Indicators as a tool can provide supplementary information to improve management for sustainable fisheries. They can be used to formulate fishery management policies and frameworks, but also to facilitate timely management actions at local, national and international levels. Several indicators should be used to track and monitor progress towards sustainability. These include indicators that reflect broader ecological, social, economical and institutional objectives.

Information system - A structured set of processes, people and equipment for converting data into information

Logbook - A record of the fishing activity registered systematically by the fisher, including catch and its species composition, the corresponding effort, and location. In many fisheries, completion of logbooks is a compulsory requirement of a fishing license.

Responsible fisheries - A concept encompasses the sustainable utilization of fisheries resources in harmony with the environment; the use of capture and aquaculture practices that are not harmful to ecosystems, resources and their quality; the incorporation of added value to such products through transformation process meeting the required sanitary standards; the conduct of commercial practices so as to provide consumers access to good quality products.

Stakeholders - Individuals or groups of individual who are involved in utilization of fishery resources and have interests in the fisheries. In fishery statistics context, stakeholders refers to individuals or groups of individual who are involved in the production and/or usage of fishery statistics for certain purposes.

Stakeholder analysis - Technique that can be used to identify and assess the priority, needs, goals, and requirements of key people that may significantly influence the success of the project. In fishery statistics context, stakeholder analysis refers to approach to be used to identify and assess the priority, needs, goals, and requirement of fishery statistics involving stakeholders concerned.

Statistical analysis - Process of applying statistical methods to obtain meaningful information from data collected. The analysis includes standard mathematical approaches that can be applied to data sets and leads to quantifiable estimates.

Survey design - Design of a sampling survey refers to the definitions and the established survey methods and procedures concerning all phases needed for conducting the survey, sample design, the selection and training of personnel, the logistics involved in the management of the field work and the distribution and receipt of survey questionnaires and forms, and the procedures for data collection, processing and analysis.

² Adapted from: SEAFDEC. 2003. Fish for the People. Volume 1 Number 1. p. 23-26

CHAPTER III

REGIONAL GUIDELINES FOR FISHERY STATISTICS FOR CAPTURE FISHERIES IN SOUTHEAST ASIA

I. General Principles

1.1 Policy and Institutional Framework

1. As an initial step, an appropriate national policy on fishery statistics should be formulated or reviewed as part of a national fisheries framework for policy-making, planning, and management to achieve sustainable fisheries. The national policy should clarify responsible institutions and delegation of functions/responsibilities from national to local levels. Due consideration should be also made to fishery statistics for small-scale fisheries in coastal and inland waters.

2. Development or improvement of national fishery statistical system should be incorporated into medium or long-term government development plan and appropriate financial and technical assistance (including a human resource development program) should be provided.

1.2 Integrating Statistics into Fishery Data and Information System

3. Best scientific evidence available should be used in the evaluation of the status and trend of fisheries, which should not be limited to fishery statistics, but also should comprise other available data, information and potential indicators. Fishery statistics can provide basic data to support indicators. This linkage should be made explicit to maximize the use of fishery statistics and their support to management of fisheries.

4. Fishery statistics should not be developed in an isolated manner but rather be part of a broader fishery data and information system, which is supported by fishery statistics through registration, records, reporting, census and surveys on one hand, and ad-hoc/specific data and information collection including the use of indicators on the other. Based on existing capacity of each country, this fishery data and information system will clarify extent of data that can be covered by fishery statistical system as well as what remains to be provided by ad-hoc data and information collection. The fishery data and information system should be developed through consultation with wider stakeholders including policy makers and researchers in order to meet the requirements of national planning and sound management, as well as the need to strengthen linkage and coordination of the stakeholders in the collection of routine and non-routine data.

1.3 Participation and Cooperation of Stakeholders

5. Close coordination and cooperation among stakeholders, including suppliers, producers and users of fishery statistics, should be enhanced through consultation as a process to ensure the availability and effective use of statistical data and information for the sustainable management of fisheries. In this connection, the stakeholders analysis could help identify the strengths and weaknesses of the major data producers and the expectations of the users of fishery statistics. Wider involvement of government agencies and industry is essential for the improvement of fishery statistics in response to the increasing demand for fishery information. The co-management approach was recognized as a strategy that could facilitate the improvement of data and information collection as well as management of small-scale fisheries.

1.4 Maximizing Fishery Statistics Usage

6. Efforts should be made to strengthen national fishery statistical systems and maximize the use of fishery statistics by focusing on clear objectives and timely results directly related to fisheries management decision-making and planning process. Awareness on potential usage of fishery statistics and their role in fisheries management and planning should be enhanced.

II. National Fishery Statistical Systems

2.1 Defining Clear Objectives and Usage

7. The general purpose of statistics in practical terms is to describe the fisheries, show the importance of different sub-sectors (either relative to each other or to the national economy) and provide inputs that can be used in policy, planning and management. However, it is necessary to clearly specify what the fisheries statistics will be used for, or more to the point, why there is a need for fishery statistics. Without proper objectives it is impossible to define the data needs that the fisheries statistical system has to fulfill. If there is no good reason to collect statistics, then simply just not do it.

8. In addition the issues that are high on the (national) agenda need to be taken into account. In many countries concerns about food security and the availability of cheap protein are top of the list, while issues of economic profitability, bio-diversity and conservation may be much lower priority. In view of the current crisis in fisheries, extra effort should be taken to adjust the statistical system to effectively tackle management and policy questions on how to optimize the benefits from the available resources.

2.2 Minimum Requirements

9. The complexity or extent of a fishery statistical system depends on the data requirements, and also on the available budget, resources and existing capacity with

fisheries staff. It is clear that the statistics that are collected should be based on what is required and the available resources. Under the limited resources/capacity as well as constraints, a fishery statistical system should not be set up as an ‘all encompassing statistical system’, the main aim is to keep the system to a bare minimum that can be maintained and managed over a long period, and still produces high quality statistics.

10. Efforts should be made to ensure that the minimum requirements of national fishery statistical system³ meet national priority. It should be emphasized that “one size does not fit all” and that some countries will have special requirements that need to be accommodated in a statistical system.

2.3 System Design and Review

11. Considering that all countries in the region have already statistical systems of some forms in place, it is essential to understand how current statistical systems work, or more precisely what information is expected to be produced by the systems and what are problems and constraints of the systems. A fishery statistical system will need to be built with the available staff and expertise present, so the existing structure, resources and capacity of staff should be known and evaluated. This needs to be done on a regular basis to facilitate improvements to the system to function more efficient. This information on the system should be properly documented and made readily available when designing and improvement of fishery statistics are performed.

12. Design and evaluation/review of the national fishery statistical system⁴ should take into consideration the following:

- Why? – Why are statistics required?
- What? – What statistics are required? What information is necessary?
- How? – How will the statistics be collected, processed and used? How reliable statistical data is? What resources are available or required?
- When? – When should statistical data and information be made available in a timely manner?
- Who? – Who is responsible for collecting the identified statistics? Who should be involved in the planning, collection and reporting process? Who are the target users of the information produced by the fishery statistical system?

³ For detail, reference can be made to the “**Minimum Requirement of A National Fishery Statistical System for Asian Countries**”, Report of the Consultation of Senior Administrators and Managers on the Strengthening of Fishery Statistical Systems in Southeast Asia, SEAFDEC. 1998. p.63-74; and Chapter 5: Statistical System Design under **5.3 Recommendations for a minimum statistical system** p.43-55 in the Handbook on Collecting Fishery Statistics for Inland and Coastal Fisheries. SEAFDEC. 2004.

⁴ For greater details of this section, reference can be made to **Chapter 5: Statistical System Design** p.38-55 in the Handbook on Collecting Fishery Statistics for Inland and Coastal Fisheries. SEAFDEC. 2004.

2.4 Data Requirements

13. What fishery data collected is largely determined by the requirements for policy, planning and management. In many countries, the wish to retain a continuous time series also influences what is collected. In most cases an intensive information requirement analysis is not done and even when a list of required data is produced, this is not based on a thorough analysis, but mainly built on the premises of the systems apply elsewhere. Assessing the information requirements is therefore essential. This can take the shape and form of stakeholder analysis, with involvement of stakeholders at various levels.

14. Requirements for statistical data with particular reference to fisheries management and current regional specific fisheries situation should be prioritized. Through regular review, statistical data required should accommodate new emerging requirements i.e. classification of commercially important fish species, etc. Quality of statistics (accuracy, reliability and timeliness) and maximum usage of statistics largely depend on application of appropriate and cost-effective data collection methodologies, validation of data, widening the application of database management and information technology, and better presentation of statistics and statistical information. And regionally standardized definitions and classifications for statistical data should be applied to facilitate regional compilation, analysis and data exchange.

15. Fishery statistic data sets at various levels have to be justified and organized in order to select the appropriate data collecting methodologies. Each methodology needs to be fine-tuned in order to be able to provide data of different degrees of aggregation. It will be wasteful collecting statistics if they are not further used, as collecting statistics means a long-term commitment.

16. It is also sensible to assess the currently available information both within and outside the fisheries sector. Often it becomes apparent that already a vast amount of fisheries related information is already available. An important step in formulating or redesigning a fishery statistical system is to assess what is already there. This can be used in the survey planning process, and also to evaluate if the current information is sufficient or additional information is required. If the available information is sufficient for initial data requirements, then it will not be necessary to initiate a survey for getting this data set. Using available information may be a very sensible first step in improving the available information on the fishery sector.

17. The amount of statistics related to fisheries related information that is collected by non-fisheries agencies is sometimes surprisingly large. General statistical surveys on employment, expenditure and demographics may contain fisheries related information. Obvious sources for fisheries information may be forestry departments, environmental, irrigation and agriculture departments. Trade, customs or economic departments may have information on marketing, transport or even production estimates. Institutes and universities sometimes have excellent research on fisheries issues and although this information may be not routine, it can provide valuable insights in the fisheries.

18. Aid organizations may have done fisheries surveys, and if these have been done at a local level, the results may not have been distributed to the central government level. Of particular interest are socio-economic surveys, that in rural areas cannot avoid having some kind of fisheries focus. This review of existing information is often done as a desktop study and is an ideal target for external (donor) funding.

2.5 Data Collection Methodologies

19. Statistics for fisheries are generally obtained through “census” to provide fishery structural data and a frame for sampled surveys, and “fishery sampling survey” to provide current fishery data. In principle, there is not just one methodology that can be used to collect a certain variable, neither there is only one source of information. Where feasible considering available budget and capacity of statistics responsible agency, data should be collected from several sources, using different methodologies. This will allow for crosschecking the results of each approach for errors. For example, catch data collected through logbooks can be cross-checked against reported landings based on sales slips (transaction), data collected by interview at landing sites and even consumer or trade data.

20. For marine fisheries (medium-scale and large-scale fisheries), statistical data is in general collected by a combination of landing site sample surveys for catch and effort, a census⁵ for the structural parameters (boats and gears) as well as surveys for marketing, processing and some livelihood parameters.

21. For inland fisheries and small-scale coastal fisheries, there is no clear consensus on what combination of approaches that can form the best choice for collecting statistics. For inland fisheries (both in terms of involvement and production) the situation is even much more complex due to the large production of the small-scale family fisheries, which methodologies, like trade or consumption data or even use of GIS, should be applied. Most of the inland fisheries and a substantial part of coastal fisheries cannot be covered by sample surveys for catch and effort. At a general level, agreement has been reached on the use of a combination of sample surveys for catch and effort for those sectors of the fishery that can be managed through gear and effort restrictions (reservoir and lake fisheries and the larger-scale commercial fisheries). Consumption (household) surveys are very important to assess fish production/consumption and involvement for the small-scale family fishing sector. In addition, surveys and censuses performed by other agencies are used as a vehicle for obtaining fishery statistics⁶.

⁵ For experience on data collection through census implementing in Indonesia, reference can be made to 1973 Fishery Census of Indonesia, Survey Methods, Mode of Analysis and Finding. A Report prepared for the Fisheries Development and Management Project, Indonesia. Rome, FAO. 1980. p. 2-13.

⁶ The detail can be referred to sub-item ‘*General selection of appropriate methodologies*’ under **Chapter 5: Statistical System Design** p. 49-54 in the Handbook on Collecting Fishery Statistics for Inland and Coastal Fisheries. SEAFDEC, 2004.

22. Inland and small-scale coastal fisheries do not often seem to be considered important enough to spend sufficient resources for data collection. Instead of relying solely on comprehensive sampling surveys for catch and effort for the whole fishery, alternatives are:

- Indicator surveys for pilot areas or fisheries using sampling surveys for catch and effort on a small-scale can be implemented to get an idea for the production and associated effort. This can be extrapolated over larger areas or other fisheries to obtain an overall estimate.
- Other approaches concentrate more on estimation for total fish production, with less emphasis on effort, and more emphasis on involvement and auxiliary information to gauge the status of the fishery, this can be done through socio-economic, consumption or fish trade surveys.

23. For both inland and coastal fisheries the use of participatory or co-management arrangements is also on the increasing trend, both as a way to devolve management to local authorities, but also as a way to obtain meaningful information on the fisheries, involving fishers and other stakeholders.

24. In different fisheries, the same variable may be collected using different methodologies. For example catch data for small to medium-scale commercial fisheries, sample surveys for catch and effort are appropriate, whereas for small-scale family fishing operations interviews or questionnaires (for catch and/or consumption) would be the best approach. Sometimes middlemen or traders keep catch/sale records and these can be used where available as the basis for the data collection. In many cases middlemen buying fish from fishers keep records for their own administration, likewise especially the larger traders at retail and wholesale markets always keep records.

25. In the planning and implementation of data collection, understanding of local fisheries officers on the purpose and potential usage of data at the local level is crucial. Usage of data collected for local requirements will be incentives to local fisheries officers to exert efforts to ensure quality of data collected and eventually improve the quality and usage of statistics at all levels.

26. Collection of statistics may seem routine, but it seldom is. There needs to be the close supervision of the enumerators, some surveys may need continuous feedback to assess the level of reliability and any statistical system should be constantly reviewed.

2.6 Data Processing, Analysis, Reporting and Presentation

27. For standard data collecting methodologies, it is important to process, validate and analyze the data collected as early as possible. Data processing, data handling procedures and database should be well established before the data collection starts. For catch assessment and other basic surveys, the database should be capable of producing all required standard outputs automatically to facilitate use of the data.

28. Reporting and presentation are the most important stage of the statistical system and a test for the applicability of the data that is collected whether it provides the information that is required to make policy decisions; can be used for effective planning; and allows formulation of management plans. Statistics by themselves are worth nothing, if the information that can be obtained is not used and brought to the attention of policy makers and planners.

29. Considering that there are a number of data sources (census, various forms of surveys, administrative records, etc.), development of a Food Balance Sheet⁷ for fishery statistics should be considered as an option to provide a means of assessing data quality and consistency. For users of statistics, the Food Balance Sheet is also useful to see the links among fishery production, export, import, consumption and processing activities.

30. As a major output, fishery statistics should be published in a yearly statistical yearbook. It requires skill and persistence to make those in charge notice. This is both publicity as well as one of the few tools available to fisheries authorities to influence the impact of other sectors on fisheries. National fishery statistical yearbook should be produced as soon as possible but not more than 2 years of completion of data collection considering the need for up-to-date statistical information and required work in the statistics production process. However, it is suggested that a preliminary assessment of national statistics in shorter period such as one year could be produced. A system to produce statistical information to accommodate the management requirements could be developed in even shorter period such as every 2 months.

2.7 Use of Information Technology (IT)

31. The use of information technology should be developed to support data and information collection, processing, analysis, presentation, and dissemination as well as data exchange. Development of database and application system at the national level as well as review and development of common regional database and application system should be made. Use of IT will not only result in error reduction from data processing and analysis but also help to disseminate the results faster to wider audience.

III. Capacity Building for National Fishery Statistical System

32. Capacity building and human resource management for statistical personnel at all levels and in various aspects of fishery statistics – system planning, data collection, processing, analysis, reporting and usage – should be developed in response to respective capacity building requirements to ensure sustainability of statistical system and higher quality of statistical data. If budget is limited, part-time enumerators may be employed under the guidance of the local fisheries officers. Capacity building programs should be developed within the context of a clear development plan for fishery statistics.

⁷ A food balance sheet presents a comprehensive picture of the pattern of a country's food supply during a specified period. It shows for each item – i.e. each primary commodity and a number of processed commodities potentially available for human consumption – the sources of supply and its utilization.

33. For policy and planning level, review of the national fishery statistical system can by itself be a capacity building to raise awareness on the importance, usage and areas of improvement of fishery statistics. The review exercises in the form of national workshops should be conducted as joint collaborative efforts by agencies concerned with fishery statistics. Sharing experiences in conducting the national workshop(s) by the Member Countries should also be promoted.

34. For technical and implementation level, various forms of capacity building activities should be promoted to address specific needs of each step of the data production program at personal and institutional levels. The training on methodologies as well as the implementation of field operations should be conducted for fishery statistical staff at the central and local (provincial/district) levels. Target groups, training needs, required training manuals and materials, appropriate methodologies and the expected outputs should be clarified and established.

35. Awareness building on importance and usage of fishery statistics as a tool to support policy-makers and contribution of fishery statistics for the national planning and fisheries management requirements is equally important. It covers provision of common understanding on fishery statistics and its system to the officials at national and local levels. Awareness building should also target at stakeholders/fishers to cooperate in providing data and information

IV. National Inter-agency Coordination

36. Fisheries line agencies do not operate in a vacuum and often other departments are involved in collecting fishery statistics at various levels. In almost all countries the central government statistics bureau at the very least influences how statistics are collected and sometimes collects nearly all statistics for different sectors. However fisheries line agencies normally have the opportunity to influence what is collected. As they should know the sector best, at least they should be able to steer the survey design process, and hence need to know what methodologies are available and be aware of the advantages and disadvantages of each methodology.

37. It is therefore crucial for improved fishery statistics that in-country coordination within the fisheries line agencies at various levels and among agencies concerned in collecting fishery statistics should be established and promoted. The coordination could not only help clarify roles and responsibilities of agencies concerned and promotion of coordination and collaboration mechanism but also economize the data collection and mobilize resources and expertise in capacity building for concerned personnel. Efforts should therefore be made to ensure coordination and decentralization of the collection and use of fisheries related statistical data between the national fisheries and other authorities including those responsible for food security, trade, vessel registration, aquaculture and rural development. This can be done in the form of establishing a national taskforce/committee to clarify a unified system for fishery statistics to ensure sustainable coordination and to avoid redundancy of work among agencies concerned at all levels.

V. Collaboration among ASEAN Member Countries and International/Regional Organizations

38. Cooperation among countries in the region as well as international/regional organizations such as FAO, ASEAN Secretariat, MRC, SEAFDEC, and relevant regional fishery management organizations (RFMOs) should be continued to support development of comparable fishery statistics and its systems by harmonizing definitions, standards and classification of statistics including statistical measurement and units as well as reporting formats. The ASEAN-SEAFDEC Network on Fishery Statistics established in 2005 should be mobilized to facilitate the purpose.

39. Efforts should be made to clarify framework and responsibility of parties concerned in the compilation of fishery statistics at international (FAO) and regional (ASEAN Secretariat and SEAFDEC) levels. These statistical compilations could, to a large extent, help improve the development of fishery statistics at the national level in a collective manner.

40. Regular consultations among parties concerned should be conducted to monitor issues important for the improvement of fishery statistics and initiate necessary actions by parties concerned. This includes identification of regional requirements in response to tropical fisheries nature when reviewing and developing standards and norms of fishery statistics by the Coordinating Working Party on Fishery Statistics (CWP).

VI. Follow-up Actions

41. With the view to further improve fishery statistics in the ASEAN region, the following are major areas to be addressed:

- Disseminating this Regional Guidelines to agencies concerned of countries in the region and raising awareness on the role of fishery statistics in planning and management of fisheries to high-level authorities to ensure their understanding and support to fishery statistics;
- Integrating fishery statistics into fishery data and information system;
- Clarifying linkages and harmonizing data collection between routine and non-routine systems; and
- Harmonizing standard definitions and classification of fishery statistics.

42. Supporting the above identified areas, the following are priority issues for improving and strengthening of fishery statistical systems. It should be noted that preferential arrangement should be given to the new members of ASEAN namely Cambodia, Lao PDR, Myanmar and Vietnam to reduce disparities among countries in the region.

Awareness and Capacity Building

43. Awareness and capacity building focuses the need for strengthening institutional and human capacity to support the systems. The priority areas are:

- Appropriate data collection methodologies for structural data of the fisheries sector and specific data for each sub-sector of fisheries
- Data handling techniques particularly at the sub-national level to ensure quality of data to be submitted for national aggregation including identification of commercially important aquatic species for data collectors and enumerators
- Statistical analysis, processing, reporting and dissemination of statistical information with emphasis on use of food balance sheets and simple computer software and database
- Application of Information Technology (IT) in fishery statistical activities aimed at improving efficiency of exploring and utilizing statistical information for management and planning of the sector
- Review of national fishery statistics and information systems to define areas of improvement in response to priority requirements of fisheries planning and management as well as coordination mechanisms among agencies who produce statistics and information related to the fisheries sector
- Awareness building on objectives and benefits of fishery statistics and information for planning and management of fisheries targeting various stakeholders to enhance their support and cooperation in producing quality data and information and compliance in management initiatives and measures
- Promoting the use of co-management approach for management of small-scale fisheries with emphasis on its role to support data and information collection
- Development and management of fishery statistics and information database
- Usage of statistics, indicators and other information to support fisheries planning and management

Research and Studies

44. Research and studies covers issues (standard definition and classification as well as data collection, analysis, processing and reporting) that need to be further investigated to allow quality information (accuracy, reliability and comparability) in cost-effective fashion. The priority areas are:

- Fisheries inventory survey to understand the current fisheries structure and activities
- Human capacity development planning for statistical personnel of both central and local levels covering aspects of planning, collection, processing, analysis and reporting of fishery statistics
- In countries where certain aspects of the national fishery statistical system are not fully developed, pilot-scale surveys can be conducted as a basis for nation-wide improvement. This will also support coordination among agencies concerned in data collection at the local level. The following are

preliminary proposals for immediate and medium-term in conducting pilot projects in the Member Countries:

- For marine fisheries in Cambodia, Indonesia, Myanmar and Vietnam;
 - For inland capture fisheries in Indonesia, Lao PDR (reservoirs), Myanmar (flood plain) and Thailand (riverine systems);
 - For coastal capture fisheries in Cambodia; and
 - For freshwater and/or coastal aquaculture in Brunei Darussalam, Indonesia, Malaysia, the Philippines, and Vietnam;
- Development of database and application system at the national level as well as review and development of common regional database and application system
 - Development of basic design for fishery statistics and information management systems
 - Investigating the data collecting methodologies appropriate for small-scale fisheries (i.e. experience from Indonesia) for future usage in the region. Collaboration with international/regional organizations such as FAO and MRC should be further promoted.

Information Development and Dissemination

45. Information development and dissemination looks into the need to compile and disseminate information on best practices, manual and guidelines to support planning and production of quality statistics and information.

- Investigate the applicability of the Regional Guidelines for Fishery Statistics for Capture Fisheries to aquaculture and where appropriate made adjustment so as to fit with the nature and requirements of aquaculture.
- Development of manuals for data collection methodologies, which are common to all countries in the region including for inland fisheries to provide a basis for their development and exchange of statistical data and related information, with particular emphasis on the catchments approach in international river basins.

Coordination and Networking

46. Networking within and among countries as well as between countries and international/regional organizations explores sharing mechanism for expertise, data and information as well as collaboration towards issues of common concern so as to improve quality of fishery statistics and information.

- Developing coordination mechanism within the fishery agencies at various level as well as inter-agency coordination mechanism among agencies concerned to identify sources of fishery statistical data and information as well as mechanism for data and information sharing
- Strengthening the communication and cooperation among countries, FAO, SEAFDEC and the ASEAN Secretariat by mobilizing the ASEAN Network

on Fishery Statistics in sharing data and information, and expertise as well as in determining issues of common concern important to the production of quality fishery statistics

- Enhancing collaboration among countries, SEAFDEC and MRC for development of fishery statistics and information with emphasis on inland capture fisheries
- Promoting collaboration among countries, SEAFDEC and UNEP/GEF South China Sea Project to enhance the use of statistics in identifying, establishing, and evaluating fisheries refugia for the sustainable capture fisheries
- Harmonizing standard definitions and classifications reflecting the multi-species/gear tropical fisheries nature to facilitate sharing of fishery statistics and information in the region as well as to contribute them to similar development at the global level. Improvement of framework, standard definitions and classification of fishery statistics in the Fishery Statistical Bulletin for Southeast Asia could very well support this activity.



ASSOCIATION OF
SOUTHEAST ASIAN NATIONS



SOUTHEAST ASIAN FISHERIES
DEVELOPMENT CENTER

Part C

REGIONAL GUIDELINES ON THE USE OF INDICATORS FOR THE SUSTAINABLE DEVELOPMENT AND MANAGEMENT OF CAPTURE FISHERIES IN SOUTHEAST ASIA

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THE REGIONAL GUIDELINES ON THE USE OF INDICATORS FOR THE SUSTAINABLE DEVELOPMENT AND MANAGEMENT OF CAPTURE FISHERIES IN SOUTHEAST ASIA

Executive Summary

- 1.0 The Regional Guidelines on the Use of Indicators for the Sustainable Development and Management of Capture Fisheries in Southeast Asia is developed to assist ASEAN member countries in the implementation of the Code of Conduct for Responsible Fisheries (CCRF) as well as the Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region with the emphasis on the use of indicators.
- 2.0 The Guidelines is an elaboration of the Regional Guidelines for Responsible Fisheries Management in Southeast Asia with emphasis on item 7.4.2 ADD.1 (indicators), which was prepared mainly based on experiences of the ASEAN member countries.
- 3.0 This Guidelines elaborates the following main topics:-
 - 3.1 Regional Common Understanding of Indicators – this section explains how “indicators” is perceived in the ASEAN regional context – not a new definition of the terminology. The explanation also includes close linkage with fisheries policy and management.
 - 3.2 Importance and Roles of in the Use of Indicators – this section outlines the roles of stakeholders in the development and use of indicators as well as how the consultation and participation of stakeholders should be promoted.
 - 3.3 Development of Indicators – this section provides basic elements, criteria and development cycle of indicators as well as interrelationship of respective components.
 - 3.4 Use of Indicators – this section elaborates on the issues and consideration that need to be taken into account when using indicators.
 - 3.5 Development of National System to Use Indicators – this section outlines basic elements of a national system for using indicators, system development process, and linkage between indicators and supporting data and fishery statistics.
 - 3.6 Follow-up Actions – this section suggests actions to be taken by the ASEAN member countries and organizations such as SEAFDEC for future development and promotion of indicators in the ASEAN region.
- 4.0 This Guidelines is supplemented by selected experiences from the ASEAN member countries, which are given in the Appendixes. This is to clarify potential application of the Guidelines in respective localities.

REGIONAL UNDERSTANDING ON KEY TERMINOLOGIES

As a basis for common understanding on the key terminologies used in this Guidelines, explanation on the following terminologies are provided.

Biodiversity – The variable among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems. Diversity indices are measures of richness (the number of species in a system; and to some extent, evenness (variances of species' local abundance). They are therefore indifferent to species substitutions which may, however, reflect ecosystem stresses (such as those due to high fishing intensity).

Fisheries management - 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 govern fisheries activities in order to ensure the continued productivity of the resources and accomplishment of other fisheries objectives.

Fishing Effort - Amount of fishing vessels and gears of a specific type (or numbers of fishing unit or total engine capacity of fishing unit) used in the fishing ground over a given unit of time.

Maximum sustainable yield (MSY) – Highest yield of fish that can be harvested on a sustainable basis from a fish stock by a given number of fishing efforts within a period of time under existing environmental conditions.

Stakeholders - Individuals or groups of individual who are involved in utilization of fishery resources and have interests in the fisheries. In fishery statistics context, stakeholders refers to individuals or groups of individual who are involved in the production and/or usage of fishery statistics for certain purposes.

I. INTRODUCTION

Background

1. In the Code of Conduct for Responsible Fisheries (CCRF) and its overall objectives for sustainable development of fisheries, the need for the use of indicators to determine how well these objectives are being pursued and whether the broader goals of sustainable development are being achieved is stressed.

2. In line with the CCRF, the ‘Plan of Action’ adopted at the ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security in the New Millennium: “Fish for the People”, organized from 19 to 24 November 2001 in Bangkok, Thailand, emphasizes the importance of the use of indicators to support fisheries management in the ASEAN region. As a basis for formulation of guidelines, the Plan of Action, in its item 6 under the Fisheries Management section, states the need to:

“Formulate guidelines to promote the use of practical and simple indicators for multi-species fisheries as a substitute for classical fisheries management models within the national fisheries management framework, with particular regard to facilitating timely local level fisheries management decisions.”

3. The Plan of Action is also supported by the “Regional Guidelines for Responsible Fisheries in Southeast Asia: Responsible Fisheries Management”, which indicates that the use of practical and simple indicators should be promoted to augment classical fisheries management models within the national management framework, with particular regards to facilitating timely local level fisheries management decision. Thus it is encouraged the ASEAN member countries should:

- Use indicators in support of management tools to achieve sustainable fisheries in the region;
- Formulate appropriate guidelines for the use of indicators as an effective fisheries management decision-making tool within the national fisheries management framework; and
- Incorporate appropriate mechanisms for collecting data and information supporting indicators in routine (national fishery statistical system) and non-routine (research) exercises.

Linkages between Indicators and Fisheries Management

4. Considering the nature of fisheries in the region, which is mainly characterized as tropical small-scale multi-species/multi-gear fisheries, the use of indicators for fisheries management in an adaptive manner is seen to be more practical, and easily understood and supported by the stakeholders.

5. Adaptive management is a paradigm shift from predictive approach to adaptive approach. Under a broad co-management concept, adaptive management is an

approach where fishery managers react on suit of indicators to undertake assessment of fisheries, resources and eco-system instead of classical stock assessment (e.g. MSY and MEY), incorporating views and knowledge of interested parties in decision-making process using best available information. Adaptive management is by itself a process to achieve management objectives and also a learning process among interested stakeholders about fisheries or system being managed in order to adapt policies and management framework to be more responsive to future conditions. The backbone of a good adaptive fisheries management system lies on a good data and information system.

Preparation and Usage of the Guidelines

6. This Guidelines was developed mainly based on the experiences gained from the ASEAN member countries. The experiences include the implementation of pilot projects which were started in 2003 initially in Brunei Darussalam, Indonesia, Malaysia, the Philippines and Thailand and completed in 2005. This Guidelines is supplemented by selected experiences from the ASEAN member countries, which are given in the Appendixes in order to clarify potential application of the Guidelines in respective localities.

7. The main objective of the Guidelines is to provide ‘inspiration’, regional reference or checklist for the ASEAN member countries that are interested in applying indicators for sustainable development and management of fisheries both in inland and marine waters. The Guidelines is not meant to be “implementation guidelines” that are directly applicable to any particular country. The Guidelines is generic in context rather than focusing on specific national situations. It is therefore suggested that the actual application of the Guidelines would require appropriate adjustment or modification, including the terminology used in the guideline so as to fit the national or local specifics on geo-political, social, economic and legal situations.

II. REGIONAL COMMON UNDERSTANDING ON INDICATORS

8. While noting that definitions can be varied, ‘fisheries indicators’ is generally referred as a practical tool to support management of fisheries. ‘Indicators’ provides information on status and trend of fisheries and resources, which can support the decision making process. There is a close link between policy objectives and the selected indicators in achieving sustainable development goals. Thus indicators used may include resource/ecological, social and economic indicators to support the management decisions.

III. IMPORTANCE AND ROLES OF STAKEHOLDERS IN THE USE OF INDICATORS

9. Wider and genuine participation of all interested stakeholders is essential for enhancing their understanding, transparency, and accountability on the application and improvement of indicators in response to the management requirements.

Consultation and involvement of stakeholders should be enhanced to ensure availability of supporting data. This will in return promote better compliance to management measures by the stakeholders particularly fishers.

10. During the planning stage, consultations with the stakeholders are crucial before the establishment of appropriate indicators. Initial consultations are important steps to introduce the concept of indicators in management, to discuss related issues, to identify the potential indicators and agreement in providing data/information. The subsequent consultations are to present the potential indicators with the latest information, select the appropriate indicators, monitor and evaluate the indicators used, and make appropriate adjustments to the development and use of indicators.

IV. DEVELOPMENT OF INDICATORS

Indicators and Supporting Data and Information

11. For sustainable use purposes, indicators should not be developed in isolation but rather be integrated as part of a broader fishery data and information system, which is supported by registration/records, fishery statistics through census and surveys, and ad-hoc/specific data and information collection or research. These data and information will provide a basis to support indicators. This linkage should be made explicit to maximize the use of fishery data and information to development and management of fisheries. The use of indicators does not only enhance understanding and encourage local authorities to collect supporting data for the local usage but it also contributes greatly to improve the quality of fishery statistics aggregated at the national level.

12. Development of indicators should utilize existing available data and where possible additional required data should be identified and obtained. Selection of indicators must be based on broader perspective, and policy relevant indicators are selected based on data requirements bearing in mind the possible importance of data that is not available. In this process, special attention should also be given to social, economic and ecological indicators.

13. Appropriate and sufficient coverage of sampled data needs to be carefully determined and collected to ensure high quality of data and indicators. The data collection for indicators should be flexible and robust to accommodate a potential change in management instruments and subsequently generate time series for “new indicators” taking into consideration the cost-benefit ratio. Level of aggregation of data supporting indicators should be determined at national and local levels considering the complexity and needs for decision-making process.

Development Process for Indicators

14. The development process for indicators is an evolving on-going learning process. The starting point of this process largely depends on specific situation. The following are suggested key steps in the development process for the use of indicators

through stakeholder consultation process.

- Defining the system scope – refers to a system to be covered. A system can be a particular fishery or a geographical area.
- Developing a system framework – refers to components within the defined system.
- Specifying criteria, objectives and potential indicators – refers to criteria, management objectives, and potential indicators that can be used to support the management. This may also include means of verification and sources/suppliers of supporting data.
- Choosing a set of indicators – refers to a suit of practical indicators that are perceived appropriate in response to the management requirements.

15. In defining the scope, the system to be covered should be manageable and focused on the sustainable development and management of fisheries. The areas of consideration are:

- Human activities (Stakeholders) – refers to resource utilization either focusing only on fishing activities or including other activities related to fisheries or other users of the area.
- Issues of focus – refers to major issues of concern in the defined system such as excess capacity, overfishing, compliance, endangered aquatic species, critical habitats, interaction between fisheries and other aquatic resource use.
- Geographical boundaries – refers to the boundary of the defined system. This can be all fisheries in a geographical area or a specific sub-sector (commercial, artisanal/traditional) or a specific fishery.
- Contribution of fisheries – refers to the role and contribution of fisheries in the sector or in a broader development objective.

16. Within the defined system, components or elements of the system should be identified. Components or elements may include fisheries sub-sectors or fishing activities (boats, gear, and fishers) in the system. The identified components or elements will then clarify criteria, objectives for the use of indicators, a set of potential indicators and appropriate reference points. It should be noted that under the adaptive fisheries management approach, reference points may not be required as a long-term target. Reference points can however be temporary and used to facilitate monitoring of the progress of the management process.

17. In line with the defined system and identified components, the criteria for selecting indicators includes:

- Resource and Ecological – e.g. landing volume, juvenile of commercial species, and important aquatic habitats
- Fishing efforts – e.g. fishing boats, fishing gear, and fishers
- Social – e.g. employment, education, and literacy
- Economic – e.g. income, landing values, and fish price

18. A number of objectives should be developed for each criterion. The objective should be directly related to sustainable development and management e.g. under Resource and Ecological, one of the objectives is to sustain biodiversity; under Fishing efforts is to increase compliance, under Social is to increase employment and livelihood level, and under Economic is to increase/improve income.

19. Subsequently, potential indicators should be determined for each objective. It should be noted that the usefulness of specific indicators differs between fisheries and geographical areas. Usefulness of selected indicators should be verified through appropriate application to the fisheries. Selection of potential indicators should take into account the following:

- Availability of time series data
- Understandability and acceptability
- Cost-effectiveness
- Practicability/feasibility
- Scientific validation
- Ability to communicate information to stakeholders

V. USE OF INDICATORS

20. The indicators should be simple, easily understood and scientifically valid to act as a communication tool among stakeholders. For effective implementation of fisheries management, indicators could be used in all the management process – planning, communication, monitoring and evaluation in fisheries management. In planning stage, indicators should be used in setting directions for developing management plan and action.

21. Efforts should be made to interpret indicators in such a way to create understanding among concerned stakeholders particularly policy makers, managers and resource users. Indicators could also be used as a tool in monitoring the effectiveness of management action and policies.

22. Use of indicators should be regularly evaluated at appropriate time intervals as part of management process to ensure their relevance to management objectives.

VI. DEVELOPMENT OF NATIONAL SYSTEM TO USE INDICATOR

23. A national system for the use indicators depends on the following components, inter alia, registration and records, fishery statistics, research and studies, enforcement activities, and stakeholder consultations.

24. Gathering of data and information should be strengthened. The relevant authority should review and evaluate the current fishery statistical system in order to identify constraints. Mechanisms to improve the system such as standard measurement and definition of variables/data should be developed to ensure national/regional compatibility of data for timeliness, reliability and availability of the information. Data

for indicator that cannot be collected by the regular statistical system and routine data sampling such as biological, ecological and social and economic should be collected under non-routine data collection.

25. The relevant authority should establish a mechanism to include application of indicators in fisheries management as well as development of synthesis in various criteria of indicators – resource and ecological, fishing efforts, social and economic. The mechanism can be in the form of a fisheries specialist group , which has proven to be useful for condensing indicator information into recommendations to policy, decision makers and managers. This mechanism will in return enhance overall improvement of quality and usage of indicators. Working methods and structure of the fisheries specialist group are important to ensure efficient and effective performance and high quality of the assessment reports . Based on the assessment reports, the fisheries specialist group could provide regular advice on the use of indicators in management of the fisheries.

26. As most countries in the ASEAN region, in one way or another has started the use of indicators in fisheries management, at least at the pilot project level, there is a need to mainstream the application of indicators at the national level so as to ensure comparable results. Efforts should be made to develop new indicators in response to the evolving management requirements.

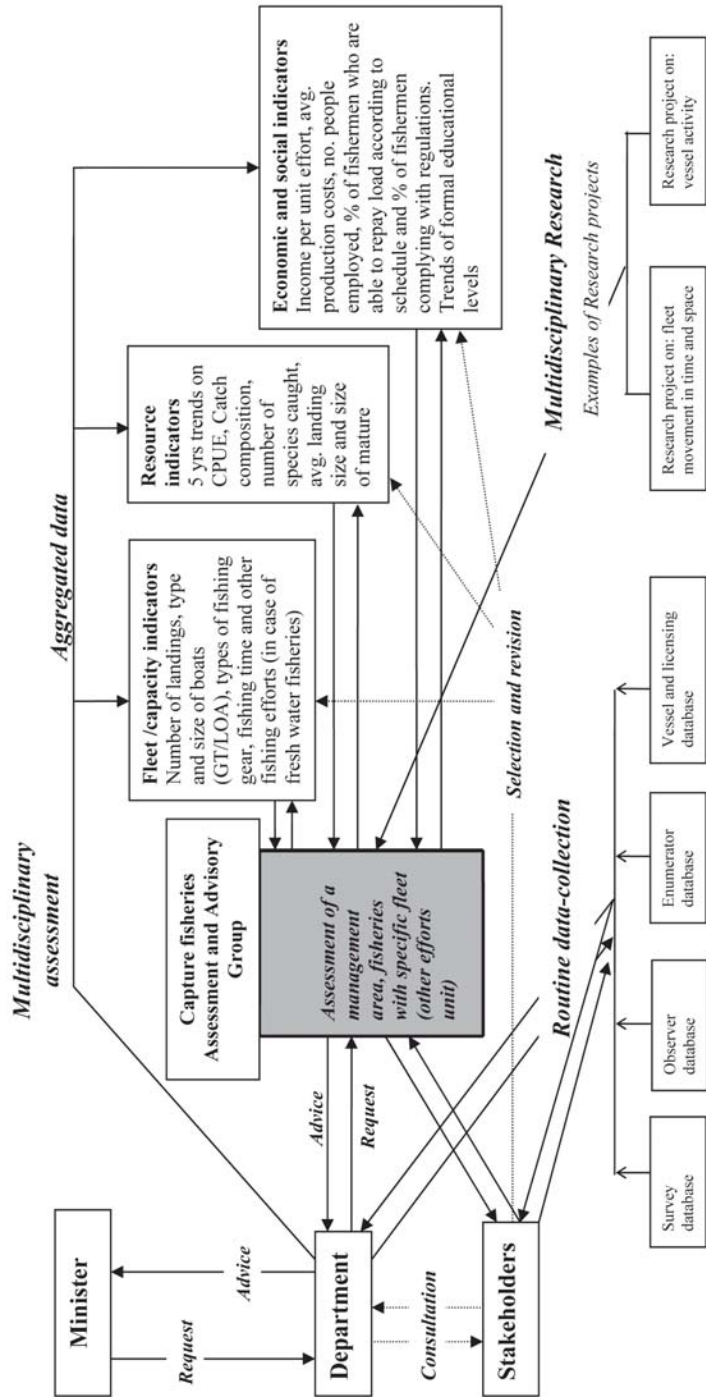
27. National capacity building programs should be developed to support the various steps in the application of indicators.

VII. FOLLOW-UP ACTIONS TO PROMOTE THE USE OF INDICATORS

28. It is strongly recommended that practical implementation of ‘indicators’ should be further promoted to support fisheries management in the ASEAN region. Appropriate steps to incorporate the application of indicators into the national management framework should be identified and conducted including familiarization on the use of indicators for fisheries management to the stakeholders.

29. Along this line, further exchange of experience and expertise in the application of indicators among countries in the region should be promoted. International/regional organizations including SEAFDEC should provide further technical support in the application of indicators as well as promote sharing of experience and raise up the issue to high-level authority to demonstrate the applicability and benefits to improve management of fisheries towards sustainable development concepts. This includes promotion on the implementation of this Guidelines and development of capacity building.

Cycle diagram for development and applying indicators in capture fisheries management in SEAFDEC pilot projects





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Part D

**REGIONAL GUIDELINES
ON THE USE OF FISHERIES REFUGIA FOR CAPTURE
FISHERIES MANAGEMENT IN SOUTHEAST ASIA**

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REGIONAL GUIDELINES ON THE USE OF FISHERIES REFUGIA FOR CAPTURE FISHERIES MANAGEMENT IN SOUTHEAST ASIA

Background

There are very few binding and non-binding international instruments addressing fisheries issues in Southeast Asia perhaps the most significant of which is the FAO Code of Conduct for Responsible Fisheries, to which most Southeast Asian countries are signatory and which provides guidance regarding the minimization of bycatch, the use of environmentally friendly fishing gear, and the creation of institutional arrangements for fisheries management.

International concern for overexploitation of fisheries resources and environmental problems caused by fishing practices, resulted in the 1992 Declaration of Cancun calling upon the Food and Agricultural Organisation of the United Nations (FAO) to develop an International Code of Conduct for Responsible Fishing. At the same time, FAO had identified a need for a guiding mechanism for use in closing the gap between government resolutions at the international level and effective implementation at the national level. In response, the Conference of the FAO adopted the 1995 Code of Conduct for Responsible Fisheries (CCRF). The CCRF is global in scope, consistent with relevant fisheries related instruments, applicable to all fisheries (including aquaculture) and voluntary in nature, being a non-binding international instrument. It provides principles and standards applicable to the conservation, management and development of all fisheries. These include:

- The conservation of aquatic ecosystems,
- Sustainable utilisation,
- The prevention of overfishing and excess fishing capacity,
- The use of the best scientific knowledge,
- The application of the precautionary approach,
- The use of selective and environmentally friendly fishing gear and practices,
- The maintenance of biodiversity and aquatic ecosystems,
- The protection of critical habitats in marine ecosystems,
- The strengthening of flag state control of fishing vessels, and
- Cooperation at sub-regional, regional and global levels.

Since adoption of the CCRF, the FAO has prepared a series of technical guidelines providing direction for the implementation of the code at the regional and national levels. These guidelines cover specific areas of the substantive articles of the Code, including fisheries management, fishing operations, the precautionary approach, the ecosystem approach to fisheries, sustainability indicators, and illegal, unreported and unregulated fishing. The CCRF also prescribes for the establishment of voluntary international plans of action (IPOAs) to deal with specific fisheries issues.

ASEAN-SEAFDEC Regional Guidelines for Responsible Fisheries in Southeast Asia

Effective implementation of the CCRF in Southeast Asian fisheries may enable the development of sustainable fisheries, although requires that sufficient consideration be given to the unique fisheries and issues that exist within the region. This is especially the case for the multi-species coastal and small-scale fisheries that are of central importance to the livelihoods and food security of most coastal communities, and for which well designed management interventions have the greatest capacity to influence the quality of life of coastal populations in the region.

In this connection, the Southeast Asian Fisheries Development Center (SEAFDEC), in collaboration with the Association of the Southeast Asian Nations (ASEAN), has been promoting the regionalisation of the CCRF. A valuable outcome of this process is a 4-set package of Regional Guidelines for Responsible Fisheries in Southeast Asia (RGRFSA), which is comprised of four publications: (1) Responsible Fishing Operations; (2) Responsible Aquaculture; (3) Responsible Fisheries Management; and (4) Responsible Post-harvest Practices and Trade. The objectives of the RGRFSA are to:

1. Clarify the requirements of the Code of Conduct for Responsible Fisheries (CCRF),
2. Identify and prioritise the required actions,
3. Identify the issues that require special consideration in the regional context,
4. Facilitate the formulation of regional policies to enable the implementation of the CCRF in the member countries of the Association of Southeast Asian Nations (ASEAN), and to
5. Facilitate the formulation and implementation by the ASEAN Member Countries of national codes of practice for responsible fisheries management.

The SEAFDEC Member Countries are Brunei Darussalam, Cambodia, Indonesia, Japan, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam. Due to the diverse range of fishery settings observed in these countries, the Regional Guidelines are not intended to provide step-by-step guidance to countries in developing fisheries management, rather they have been prepared provide inspiration and policy support to countries in their efforts to develop sustainable fisheries.

This package is currently being expanded by SEAFDEC to provide regional guidelines for small-scale and rights-based fisheries, fisheries statistics, and use of indicators in fisheries management. A valuable outcome of the on-going collaboration between the UNEP/GEF SCS Project and SEAFDEC is that following the Sixth Meeting of the Regional Working for the Fisheries Component convened in Sabah, Malaysia, from 5th – 8th September 2005, SEAFDEC invited the RWG-F to prepare guidelines on the use of the fisheries refugia concept being developed by the fisheries component for sustainable capture fisheries in the ASEAN region. These guidelines will be published in conjunction with the new SEAFDEC guidelines.

Based on inputs from the RWG-F, the PCU has recently prepared draft guidelines on the use of the refugia concept (Annex 1). The draft guidelines prepared by SEAFDEC on indicators and co-management were reviewed to provide insight into the style and appropriate content of these guidelines, however there is some flexibility in the content that may be included.

The Regional Scientific and Technical Committee is requested to:

- Review, comment upon and endorse, the work of the RWG-F to date on a Regional System of Fisheries Refugia;
- Provide guidance regarding the future development of the system; and,
- Advise on the optimum manner in which the South China Sea Project can promote further development of the adoption of a system of fisheries refugia in the region.

Introduction

1. The FAO Code of Conduct for Responsible Fisheries (CCRF) highlights the need to explore the use of alternative and innovative management approaches in order to achieve sustainable fisheries.

2. Alternative and innovative approaches to fisheries management, especially those focusing on fishery and ecosystem linkages, have recently received high-level international recognition. During the 2001 Reykjavik Conference on Responsible Fisheries in the Marine Ecosystem, participants approved the Reykjavik Declaration on Responsible Fisheries in the Marine Ecosystem. The Reykjavik Declaration states that in an effort to reinforce responsible and sustainable fisheries in the marine ecosystems, “we will individually and collectively work on incorporating ecosystem considerations into that management to that aim”.

3. The World Summit on Sustainable Development (WSSD) in Johannesburg, South Africa, 2002, considered the Reykjavik Declaration in adopting a political declaration and plan of implementation in relation to capture fisheries. In the WSSD Declaration, the Heads of State agreed to “develop and facilitate the use of diverse approaches and tools, including the ecosystem approach, the elimination of destructive practices...the integration of marine and coastal areas into key sectors”.

4. At the regional level, the ‘Plan of Action’ adopted at the ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security in the New Millennium: “Fish for the People”, organised from 19 to 24 November 2001 in Bangkok, Thailand, emphasises the importance of the use of alternative management to support fisheries management in the ASEAN region.

5. The ASEAN-SEAFDEC “Plan of Action” is also supported by the ASEAN-SEAFDEC “Regional Guidelines for Responsible Fisheries in Southeast Asia” which indicate that alternative management approaches should be promoted to augment classical fisheries management models within national management frameworks.

6. These Regional Guidelines on the Use of Fisheries Refugia for Sustainable Capture Fisheries in Southeast Asia have been developed to assist ASEAN member countries in the implementation of the Code of Conduct for Responsible Fisheries (CCRF) as well as the Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region.

7. The concept of fisheries refugia as promoted in these guidelines has been developed by the Fisheries Component of the UNEP/GEF Project Entitled “Reversing Environmental Degradation Trends in the South China Sea and Gulf of Thailand” (UNEP/GEF SCS Project) in collaboration with the Southeast Asian Fisheries Development Center (SEAFDEC) for the development of a regional system of fisheries refugia.

8. These Guidelines build upon the Regional Guidelines for Responsible Fisheries in Southeast Asia with emphasis on item 7.6.4 ADD. 1 on Responsible Fishing, which states that in terms of taking appropriate action to ensure that fishing gear, methods and practices that are not consistent with responsible fishing are phased out and replaced with more acceptable alternatives:

“(8) States should consider area or seasonal closure to protect critical stages of life cycle of fisheries resources.”

The Guidelines also build upon item 7.6.9 of the Regional Guidelines on Wastes, Discards, and Ghost Fishing, which states that in terms of taking appropriate action to minimise waste, discards, catch by lost or abandoned gear, catch of non-target species, both fish and non-fish species, and negative impacts on associated or dependent species, in particular endangered species:

“(2) States should strongly implement management measures such as closed areas and seasons in critical habitats (e.g. coral reefs, seagrass beds, mangrove areas, etc.) which are important for sustaining fish stocks.”

9. Importantly, these guidelines focus on encouraging ASEAN member countries to embrace the use of fisheries refugia in fisheries management as a means of building the resilience of fish populations to the effects of over-fishing, which is especially relevant regionally in terms of food security.

Regional Fisheries

10. Fisheries make significant contributions to regional economies, particularly those of countries bordering the Gulf of Thailand and the South China Sea. However, since the majority of fisheries are small-scale in nature, and land fish in a large number of small decentralised landing places for distribution through complex marketing networks at the community level, estimates of the value of capture fisheries production are largely underestimated and do not adequately value the small-scale fishing sector.

11. Most regional countries are in the top 20 capture fishery producing countries in the world, with some experience annual increases in production of up to 5 percent. Pelagic fishes dominate landings by volume and value, as demersal fisheries have been largely over-exploited. However, it is well accepted that regional fisheries statistics rarely reflect production information for small-scale coastal fisheries and do not adequately reflect the high level participation of coastal communities in fishing, or the importance of artisanal and subsistence fishing to coastal communities.

12. Declining fish availability, coupled with over-capacity and the dependence of the small-scale sector on coastal fisheries for income generation has led to the adoption of destructive fishing practices such as blast fishing to maintain short-term incomes and food production. Similarly, based on present consumption patterns and population growth rates, pressure on coastal fisheries is steadily increasing. Despite nutritional requirements and current population growth rates, regional countries are generally net exporters of fishery products. This trade pattern is continuing since the need to generate foreign exchange to buy capital inputs for industrialisation generally continues to be a higher priority than food security.

13. Fisheries trends suggest that production from capture fisheries will wane in coming years unless fishing effort (and related over-capacity) is reduced. The obvious problem in the reduction of fishing capacity is that regional fisheries are mostly small-scale in nature with the majority of participants (and their families) highly dependent on fish catches for income, food and well-being.

14. Regional initiatives in the development of sustainable fisheries, including the decentralisation of fisheries management, the use of rights-based approaches to small-scale fisheries management, and the improved use of statistics and indicators, will need to consider alternative fisheries management tools. The example expounded in these guidelines is based on the use of area-based or zoning approaches to fisheries management that aim at maintaining the habitats upon which fish stocks depend, as well as minimising the effects of fishing on stocks of important species in areas and at times critical to their life-cycle.

Emerging Themes for Regional Fisheries Management

15. Key themes emerging from the fisheries component of the UNEP/GEF SCS Project relate to the critical role that coastal and marine habitats of the Gulf of Thailand and play in sustaining regional fisheries, many of which are transboundary in nature, and the low level coordination between fisheries and habitat management in the region. It is now well recognised that coral reef, seagrass, mangrove, and wetland habitats contribute significantly to the productivity of regional fisheries, and act as refuges for the majority of fished species during critical phases of their lifecycle.

16. In this connection, the UNEP/GEF SCS Project has initiated activities, in collaboration with SEAFDEC, to enhance the use of spatial approaches to fisheries management that, focus on fishery and habitat linkages.

17. This initiative is considered important regionally because of the potential regional fisheries benefits associated with effective fisheries and habitat management at the local level. It is likely that the role of such approaches to fisheries management will become more important in the region, especially in light of the continuing importance of fisheries to food security, nutritional security, and maintenance of livelihoods.

18. Such approaches may also assist in curbing the effects of trends in regional fisheries relating to over-capacity and over-exploitation, the use of destructive fishing gear and practices, habitat destruction and pollution, and illegal fishing.

Fisheries Refugia and Fisheries Management in the ASEAN Region

19. These Guidelines recognise that most common approaches to fisheries management in the ASEAN region have not effectively integrated spatial considerations into fisheries management frameworks. The success or failure of fisheries management has largely been determined by the ability of the management system to control fishing effort so as not to exceed predetermined catch limits that are based on biological and, to a lesser extent, economic attributes of fisheries.

20. Fisheries management worldwide has largely been constrained by an inability to address the complexity inherent in fisheries systems. Fisheries systems involve the interrelationships of such dynamics as environmental variability, multi-species interactions and unpredictable effects of fishing on fish stocks. Such complexity not only influences the effectiveness of policy intervention, but also the accuracy of indicators used to assess the effectiveness of policy intervention. This is especially the case in Southeast Asia, given the diversity of cultural settings, unique fisheries structure, and the complex tropical ecosystems of the region.

21. Considering that many of the data used in the assessment of fisheries resources and fisheries management measures in the ASEAN region contain errors, and that many common assessment models grossly simplify fisheries systems, it is inevitable that fisheries management will continue to take place in situations where there is irreducible uncertainty due to the massive and difficult information problems associated with describing and understanding most fisheries. This is especially true in the Gulf of Thailand and the South China Sea, where fisheries management must balance the interests of multiple jurisdictions, coastal community dependence on fisheries for food security, the problem of overfishing, destructive fishing practices, and the inherently complex nature of the tropical multi-species fisheries in the region.

22. The concept of fisheries refugia espoused in these Guidelines is based upon the emerging body of evidence that the existence of natural refugia is a basic element explaining the resilience of commercial fish stocks to exploitation. Commercial fisheries in the ASEAN region are subject to high levels of fishing effort, such that stocks of most commercially important species are considered fully fished or overexploited. Maintenance of natural refugia, or creation of refugia in cases where natural refugia no longer exist, should be important priorities for the management of fisheries in the

ASEAN region, and may act as effective buffers against uncertainty and recruitment failure, of which the latter is especially important in terms of food security.

23. Natural Refugia play a central role in the sustainability of fisheries. The existence of large-scale natural refuges for populations of fished species contributes to the resilience of communities of commercially fished species to the effects of high fishing effort levels.

24. The concept of natural refugia is well developed in the fields of terrestrial ecology and wildlife management. For instance, the use of spatial controls that recognise the potential “source-sink” nature of hunted systems and protecting natural refugia, is often effective in avoiding wildlife over-exploitation when biological data and enforcement capabilities to regulate harvests are limited, and may provide more reliable evaluations of sustainability, provide information on the dynamics of hunted systems, and help local communities and policy-makers conserve key areas that act as game reserves.

25. In the context of fisheries, natural refugia arise from the interaction of the spatial dynamics of the population, oceanographic features, fish behaviour, and fishing effort dynamics. Three broad types of refugia are readily discernable:

- A large population with seasonal or spawning migrations between fishing grounds and spawning refugia,
- A large population with some local sub-populations located in fishing grounds and others in refugia. Sub-populations located in unexploited areas provide larval subsidies to the exploited populations, and
- In situ behavioural refugia (behaviour determines the seasonal unavailability of part of the stock in the fishing ground).

26. Fisheries refugia can complement conventional fisheries management measures, such as effort or gear restrictions, and should be a priority consideration in the ASEAN region in situations where fisheries are subject to intense and/or unmanageable fishing pressure. They may also be used to separate potentially conflicting uses of coastal and marine habitats and their limited resources. However, the effectiveness of fisheries refugia will largely depend on the selection and appropriate use of fisheries management measures within the refugia area, and at the most general level, the process of establishing fisheries refugia must consider the:

- Life-cycle of the species for which refugia are being developed,
- Type(s) of refugia scenarios(s) that relate to the species for which refugia are being developed,
- Location of natural refugia and appropriate sites for the establishment of [artificial] refugia, and
- National and regional level competencies in the use of fisheries management measures and spatial approaches to resource management and planning.

Regional Common Understanding of Fisheries Refugia

27. Fisheries Refugia in the ASEAN context are defined as:

“Spatially and geographically defined, marine or coastal areas in which specific management measures are applied to sustain important species [fisheries resources] during critical stages of their lifecycle, for their sustainable use.”

28. Fisheries Refugia should:

- NOT be “no take zones”,
- Have the objective of sustainable use for the benefit of present and future generations,
- Provide for some areas within refugia to be permanently closed due to their critical importance [essential contribution] to the life cycle of a species or group of species,
- Focus on areas of critical importance in the life cycle of fished species, including spawning, and nursery grounds, or areas of habitat required for the maintenance of broodstock,
- Have different characteristics according to their purposes and the species or species groups for which they are established and within which different management measures will apply,
- Be sub-dividable to reflect the differing importance of sub-areas to the species or species groups for which they are established. Management plans for the refugia should reflect different fisheries management measures for the sub-divisions.

29. Management measures that may be applied within fisheries refugia may be drawn from the following [non-exhaustive] list:

- Exclusion of a fishing method (e.g. light luring purse seine fishing),
- Restricted gears (e.g. mesh size),
- Prohibited gears (e.g. push nets, demersal trawls),
- Vessel size/engine capacity,
- Seasonal closures during critical periods,
- Seasonal restrictions (e.g. use of specific gear that may trap larvae),
- Limited access and use of rights-based approaches in small-scale fisheries.

30. There is a general commonality of understanding that fisheries refugia relate to specific areas of significance to the life-cycle of particular species. Fisheries refugia may be defined in space and time, and serve to protect spawning aggregations, nursery grounds, and migratory routes.

Fisheries Problems, Goals and Objectives, and Challenges

31. The promotion and use of the fisheries refugia concept in the ASEAN region is aimed at improving the use of spatial approaches to fisheries management for the sustainable use of fisheries. The specific fisheries management problems in the ASEAN region that fisheries refugia will assist in resolving include the:

- Capture of juveniles – an action focused on reducing the risk of growth over-fishing due to young recruits to the fishery being caught before they grow to an optimal market size, or a size at first capture less than that required to maximise yield (or value) per recruit,
- Capture of spawning stock in spawning areas at the time of spawning – an action focused on reducing the risk of recruitment over-fishing due to adult stock being reduced to the extent that recruits are insufficient to maintain commercial fish stocks,
- Use of inappropriate fishing gears and practices,
- Poor management of fish habitats, particularly spawning and nursery areas, and
- Conflicts among resource users – such as those between small-scale and large-scale fisheries.

32. Whilst recognising that the overall goal associated with the use of fisheries refugia is to improve the use of spatial approaches to fisheries management for sustainable use of fish stocks and maintenance of habitats, objectives relating to fisheries refugia should be developed in close consultation with stakeholders. In defining such objectives, ASEAN member countries should consider objective-related indicators for use in evaluating the performance of fisheries refugia. Specific objectives may be drawn from the following [non-exhaustive] list and should be defined in terms of temporal and spatial scales:

- Safeguarding of spawning and nursery areas and commercial species within these areas at critical stages of their life cycles,
- Enhancement of fisheries resources and their habitats,
- Prevention of habitat degradation and commercial-extinction of important fishery species,
- Improved co-ordination between fisheries and environment agencies and organisations,
- Improved use of zoning in fisheries management,
- Improved incorporation of species-specific life history characteristics in fisheries management systems,
- Improved understanding amongst stakeholders, including fisher folk, scientists, policy-makers and fisheries managers of ecosystem and fishery linkages, and
- Promotion of the role of refugia in enhancing the resilience of fisheries systems.

33. The use of fisheries refugia as a fisheries management tool is a relatively new concept in the ASEAN region. ASEAN member countries should anticipate a number of challenges in the establishment of refugia, and ensure that these challenges be assessed in the context of national scientific, legal, political and administrative contexts. The general types of anticipated challenges are:

- The problem of overcapacity,
- Resistance from fisher folk and fishing communities,
- Lack of scientific information and experience in the use of spatial approaches to fisheries management,
- Difficulties and costs associated with research, specifically the need for specialised vessels/sampling equipment in collecting information regarding the life cycle of commercially important species,
- Low-level collaboration between the responsible national level agency and local government,
- Encroachment during periods in which fishers are excluded,
- Enforcement of management measures and regulations prohibiting the use of illegal or destructive fishing gear, in order to prevent the unnecessary capture of juveniles and degradation of fisheries habitats.

Priority Fisheries Refugia Types: Spawning and Juvenile Refugia

34. In relation to fisheries, the two main life history events for fished species are reproduction and recruitment. Often, these events involve movement between areas, and some species, often pelagic fishes, migrate to particular spawning areas. Many species also utilise specific coastal habitats such as coral reefs, seagrass, mangroves, and wetlands as nursery and feeding areas. In terms of the effects of fishing, most populations of fished species are particularly vulnerable to the impacts of high levels of fishing effort in areas where and at times when, there are high abundances of (a) stock in spawning condition, or (b) juveniles and pre-recruits.

35. The impacts of fishing on spawning stock and juveniles/pre-recruits are intensified in instances where small-scale fishers and commercial fishers share the same stock, leading to disputes of the relative impacts of each group. An example is where juveniles and pre-recruits are caught in inshore areas by small-scale fisheries, and commercial fishers catch adults of the same species offshore. In this instance, high levels of fishing effort in inshore waters may drive growth over-fishing¹, while the same circumstances in offshore areas may cause recruitment over-fishing¹ of the same stock² (Figure 1). The use of juvenile refugia to protect fish during the juvenile and pre-recruit phases of their life-cycle can assist in the prevention of growth over-fishing. Whereas spawning refugia, may assist in the prevention of recruitment over-fishing.

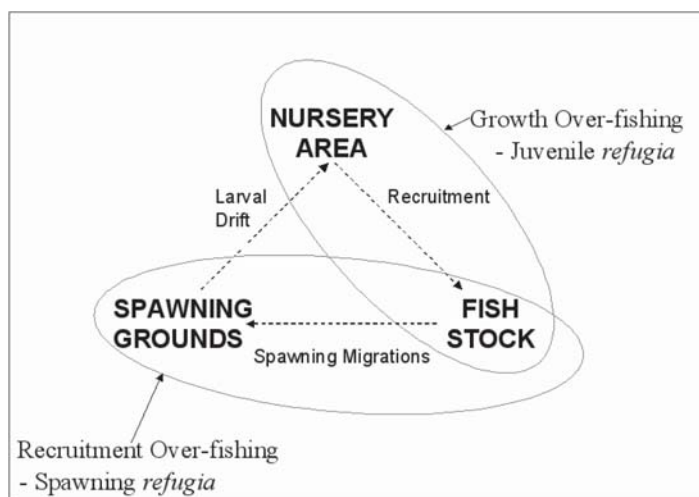


Figure 1 Generalised life-history triangle for fished species, highlighting the problems of growth and recruitment over-fishing.

36. Landings from commercial fisheries in the region are dominated by small pelagic species. The problem of recruitment over-fishing is considered to be most relevant to these species and the identification of spawning refugia should be prioritised for important pelagic species. Spawning refugia may also be effective tools for the management of recruitment over-fishing problems in the context of commercial invertebrate species.

37. There is a scarcity of spawning area information relating to demersal species in the Gulf of Thailand. However, in terms of the decline in the availability of the majority of these species, the problem of growth over-fishing prevails and the use of juvenile refugia should be a priority for demersal fisheries management in the region. It is apparent there may be most benefit in establishing juvenile refugia in the context of inshore habitat management. The design of appropriate fisheries refugia in association with initiatives in inshore habitat management may assist in reversing the growth over-fishing problem common to many of the region's coastal demersal fish species.

38. It is recognised that, detailed data are not available concerning the life-cycles and movements of many fish stocks. Nevertheless development of a system of refugia should proceed, during the course of which the lack of data will become apparent, enabling identification of future areas for fisheries research. In this connection, the important role that SEAFDEC plays in regional fisheries research should be fostered, especially in relation to its capacity to conduct larval and juvenile fish sampling throughout the region.

¹ Growth over-fishing is caused by levels of fishing beyond that required to maximise yield per recruit, and typical involves a size at first capture in the fishery that involves an unsustainably high percentage of juveniles and pre-recruits being captured.

² Recruitment over-fishing is caused by a level of fishing in which the adult stock is reduced to the extent that recruits produced are insufficient to maintain the population.

Establishing Fisheries Refugia

39. States should consider a two-track approach to the identification of fisheries refugia. The first track involves a review of known spawning areas for pelagic and invertebrate species, with the aim of evaluating these sites as candidate spawning refugia. Information regarding the spatial dynamics of pelagic fish and invertebrate populations, oceanographic features, fish behaviour, and fishing effort dynamics should be used to determine the optimum locations and sizes of spawning refugia. The second track is the evaluation of inshore areas as potential juvenile/pre-recruit refugia for significant demersal species. These juvenile refugia should be aimed at reducing the impact of growth over-fishing and may be identified using information regarding the catch and size composition of small-scale and commercial fisheries operating in or adjacent to sites.

40. Possible directions for establishing and implementing fisheries refugia are suggested by the legislative, policy and administrative options and approaches taken by regional countries for coastal and marine planning, including for instance the designation of areas closed to fishing and other zoning measures. It is likely that there will be inter-country differences in the primary planning objectives, and the design and implementation (i.e. legislative, policy and administrative approaches) of spatial approaches to natural resource and environmental management. These differences will need to be identified and reflected in any regional assessment of the design and effectiveness of a system of fisheries refugia.

41. It is likely that the countries will reflect differences in:

- Their strategic policy and planning objectives, including the:
 - * type of planning (e.g. protection v. multiple use);
 - * area of planning (e.g. administrative boundaries v. geo-ecological (coastal zone));
 - * designated management agencies (e.g. environment v. resource agency).
- Establishment and administration of spatial management approaches, including:
 - * the spatial planning process (e.g. administrative steps involved);
 - * identification of sites;
 - * selection and prioritisation of sites;
 - * socio-economic assessment of the impacts of management measures;
 - * consultation, community participation.

42. There are a number of common information requirements that regional countries should consider in the development of fisheries refugia. These relate to the:

- Life-cycle of the species for which refugia are being developed,
- Type(s) of refugia scenario(s) that relate to the species for which refugia are being developed,

- Location of natural refugia and appropriate sites for the establishment of [artificial] refugia,
- National and regional level competencies in the use of fisheries management measures and spatial approaches to resource management and planning that may be applied in establishing and managing refugia,
- Goals, objectives, guiding principles, and expected outcomes for the refugia from both national and regional perspectives,
- Priority refugia types, definition of the actual fisheries problems that the refugia will assist in resolving, the anticipated challenges in the establishment of fisheries refugia, and complementary activities in the region,
- Criteria for refugia identification and selection, and
- The actions required at the national level to establish fisheries refugia, including identification of legislative, policy and administrative requirements and support.

43. States should focus on establishing fisheries refugia with a very clear fisheries agenda and based on the concept of sustainable use. Primary criteria for refugia identification should focus on habitats critical to the life-cycle of commercially important species.

Fisheries Refugia and Marine Protected Areas

44. In establishing fisheries refugia, states should recognise that, a no-take Marine Protected Area (MPA) can potentially assist in insuring against over-exploitation and may enhance yields in adjacent fisheries. However, the ecological criteria commonly used for MPA site selection in the region that, include biodiversity, naturalness, uniqueness, and vulnerability criteria, may result in the establishment of MPAs that are ineffective in (a) safeguarding fished species at critical phases of their life-cycle, and (b) may not minimise the impacts of high fishing effort levels at times and places when fish populations are particularly vulnerable to the effects of fishing, such as when they are spawning or utilising inshore areas for feeding and/or for protection from predators.

45. States should recognise the role MPAs play in marine conservation. While the use of fisheries refugia may result in some of the conservation benefits associated with MPAs, they should not be promoted as substitutes for MPAs. However, from the fisheries perspective, the difference between no-take MPAs and sustainable use fisheries refugia should be clearly communicated to government officials and coastal communities in establishing fisheries refugia, as the fishery and critical habitat linkages intrinsic to the fisheries refugia concept may be more easily accepted by stakeholders than MPAs.

Complementary Initiatives in Regional Fisheries Management

46. Against the general background of uncertainty and complexity associated with the development of fisheries refugia there is a need to develop robust and workable solutions to involving stakeholders in the establishment and management of refugia.

An emerging appreciation of the diverse traditions and cultures in the region, and the important role of small-scale, coastal and subsistence fisheries has recently provided impetus for the development of new approaches to stakeholder participation in Southeast Asian fisheries management.

47. A key perspective in the region is that over-exploitation problems may be a sign of community failure, in that community values, norms, and knowledge are critically important in guiding sustainable fisheries practices and that the erosion of such community arrangements for the management of fisheries may open the door to “over-fishing”. In this connection, significant efforts are being made in the region to decentralise the responsibility of fisheries management with an aim of establishing co-management approaches to fisheries. States should promote the co-management of fisheries refugia.

48. The notion of rights-based approaches to the management of the region’s small-scale coastal fisheries is also gaining ascendancy. Examples of rights based fisheries management systems are currently being promoted by the Southeast Asian Fisheries Development Center and governments in the region, with a notable case study being the communalisation of fishing rights as developed in the inshore fisheries of Japan, where the use of community based territorial use rights, reinforced by local modes of social regulation, have been successful in preventing over exploitation. The use of use rights and collective choice rights should be promoted in the context of fisheries refugia management.

49. It is also recognised that regional fisheries management must incorporate strategies that aim to foster the dependence of fisheries on coastal and marine habitats. This will require developing mechanisms aimed at minimising fishery impacts on the habitats upon which fisheries depend, and consideration of the regional fishery benefits of effective coastal habitat management. Efforts should be taken to minimise fisheries impacts on fishery refugia habitats.

50. The improved use of statistics and indicators in identifying and managing fisheries refugia should be encouraged. In addition to their use in monitoring and tuning management action, statistics and indicators can be useful in communicating with cross-sectoral agencies and have significant potential for use in community education and awareness programs.

51. Practical uses of indicator systems for fisheries refugia include identifying areas with high abundances of juveniles or spawning stock, and use by fishing communities to assess the performance of policy or regulations. However, a key constraint in the use of indicators in fisheries is the information required to drive them. Often this information is unavailable, pointing to the need for a limited number of fishery-specific indicators with some integrated properties (i.e. indicators reflecting the status of more than one component of the fishery).

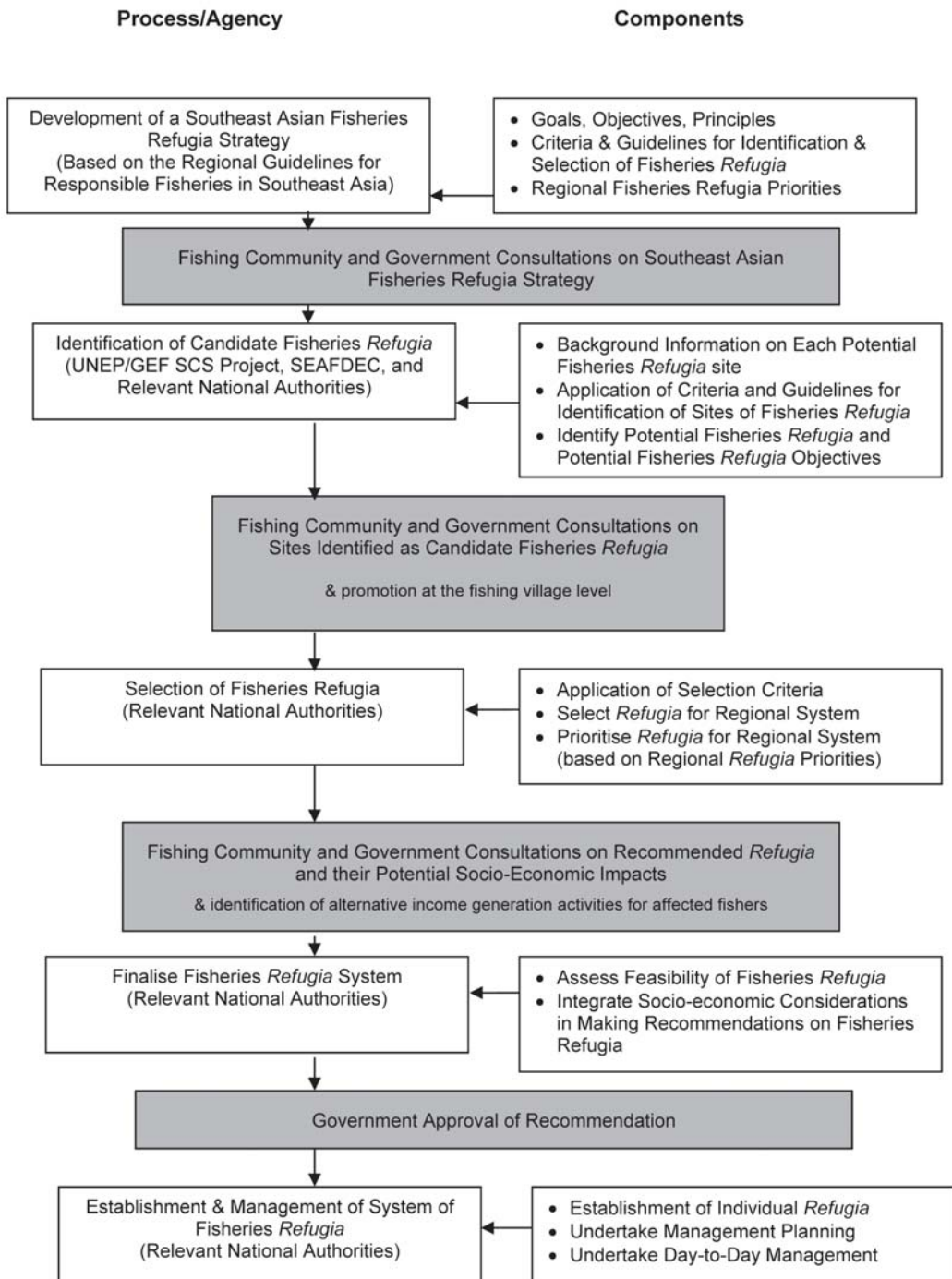


Figure 2 Framework for the development of a regional system of fisheries refugia for sustainable capture fisheries.