Capacity development for improving the knowledge base for fisheries management in South East Asia

A regional initiative, implemented locally
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A regional initiative, implemented locally

by
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FAO Regional Office for Asia and the Pacific
Bangkok, Thailand
2009
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For bibliographic purposes, please reference this publication as:

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1 Introduction

Small-scale fisheries are typically considered to be a significant component of the marine capture fisheries sector in Southeast Asia because of their importance in terms of income generation, contribution to food production and to coastal livelihoods. This importance, however, is not well reflected in the decision-making and policy formulation processes affecting the fisheries sector. Fishing operations, particularly in small-scale fisheries, remain largely unregulated and usually the sector as a whole and the role it plays in the livelihoods of coastal dwellers remain poorly understood. General knowledge about the extent to which fisheries and coastal resources are used by people living in coastal areas to strengthen their livelihoods is poor, and often decisions affecting the fisheries are made without consideration of the potential impacts on the livelihoods of small-scale fishers and other resource users.

Institutions with a mandate to oversee the management of capture fisheries and the marine environment are establishing policies and making decisions largely in the absence of reliable information on key indicators such as the numbers of fishers involved and the number of boats and gears being used, and without an understanding of the perspectives or priorities of fisher communities. As a result, public sector interventions are often misguided and in some cases can exacerbate the very problems that they are intended to solve.

The very nature of small-scale coastal fisheries in the region renders conventional approaches to fisheries management and their respective information needs ineffective. National fisheries information systems usually comprise some form of aggregated catch and effort data that, even if they were more accurate than they are now, would still not be very useful for addressing the local management needs of small-scale coastal fisheries.

An increasing trend in decentralization and the active participation of fishers and other stakeholders in the management of coastal fisheries resources are widely seen as effective ways to address these management and decision-making gaps and thus considered a precondition for effective and successful management of the resources in question. With the transfer of resource user rights to local stakeholders and fishing communities and the devolution of management authority to the local level and stakeholder organizations, the involvement of fishers and other resource users in the generation of information and knowledge becomes an integral part of the management process. Such engagement of fishers in data collection and information generation for fisheries management is an important initial step in increasing stakeholder participation in decision-making and management.

1.1 The initiative “Strengthening capacity in fisheries information gathering for management”

“Strengthening the capacity in fisheries information gathering for management” is the title of the Food and Agriculture Organization of the United Nations (FAO) project GCP/RAS/199/SWE, funded by the Swedish International Development Cooperation Agency (Sida), that provided the framework and the necessary financial inputs for the implementation of this initiative. The project was designed to contribute
to FAO’s long-term strategic goal of changing national and regional perceptions of how fishers can be effectively incorporated into fisheries management mechanisms. FAO believes that changes in these perceptions will lead to more effective institutional decision-making based on quality information and improved stakeholder dialogue. This in turn will lead to more satisfactory conflict resolution and increased sustainable management of fisheries resources. The project’s development objective encapsulated this strategic goal and was stated as, “Enhanced management of fisheries resources through effective decision-making and policy development, based upon appropriate information and facilitation of stakeholder dialogue”.

Under this general development goal, the immediate objective of the project was the generation, communication and use of quality information that enable the development of appropriate policies and management interventions relevant to the respective needs of small-scale fisheries and larger, commercial fisheries in the four participating countries.

To achieve this, the project aimed at increasing:

- the capacity of national and sub-national level fisheries-related institutions to identify information needs for management, conflict resolution and decision-making for commercial fishing, small-scale fishing and aquaculture;
- the capacity of local fisheries-related institutions to collect, analyze and synthesize appropriate information for use in decision-making, including decisions on issues related to poverty, food security, gender and HIV-AIDS, which are linked to livelihoods; and
- the overall acceptance of participatory approaches as mechanisms for stakeholder dialogues and the development of partnerships/alliances.

The project also aimed to improve stakeholder dialogues in local fisheries management planning and decision-making.

The project understood that the development of better practices in fisheries management by means of involving stakeholders in information collection and management would need to combine assistance to the information users in identifying their information needs and the opportunity to try out new methods of working with stakeholders. The acceptance of new modes of working practice by both government officers as well as resource users is usually not immediate and occurs through incremental change. This change requires adequate exposure, some guidance or facilitation and, very importantly, positive feedback from both stakeholders and the officers’ institutions.

The project thus focused on supporting pilot processes in selected Southeast Asian countries to test and verify the validity of such new approaches in fisheries information generation for management; in doing so, the different levels of fisheries development in the Southeast Asian region were taken into account by choosing four countries that are representative of the regional differences within the fisheries sector.

What follows is the story of this project, or in other words the story of a regional initiative that sought to build capacity for translating the principles of stakeholder involvement, dialogue and co-management into actually improving the knowledge base for the management of coastal and marine capture fisheries in four Southeast Asian countries: the Kingdom of Cambodia (Cambodia), the Kingdom of Thailand (Thailand), the Democratic Republic of Timor-Leste (Timor-Leste) and the Socialist Republic of Viet Nam (Viet Nam).

This narrative will describe various approaches to building communicative processes among fisheries stakeholders, look at the individual outcomes of national activities and seek to highlight such lessons, which may have some value beyond the immediate local or national level.
Cambodia: engaging fishing communities in the generation and use of fisheries information
Fishing and eating fish are innate features of Cambodian society. Fish is an essential staple food for Cambodians, with an estimated annual per capita consumption of over 60 kg, and nearly every Cambodian engages in fishing activities at least occasionally. During the rainy season when the Tonle Sap (Great Lake) can expand to more than 14 000 km$^2$ and the waters in the floodplains are at their highest levels, people from all over the country migrate to the flooded areas and join in the annual harvest of fish. The annual inland fish production has been estimated to be at least 400 000 tonnes.

- Length of coastline: 435 km
- Claimed EEZ: 55 600 km$^2$
- Marine fisheries: 55 000 t
- Marine aquaculture: 1 600 t
- Mangrove area: 56 188 ha

Fig. 1 Map of Cambodia and its coastline

This richness and productivity of Cambodia’s inland water resources and their importance for Cambodian people have dominated the country’s fisheries policies for a long time; government efforts in fisheries development and management have focused on restructuring and reforming the inland fisheries sector, whereas marine capture and coastal fisheries have had less attention from the responsible government authorities.

The country has a coastline of less than 450 km and an EEZ of 55 000 km$^2$. Being relatively shallow (the average depth is about 50 m), Cambodia’s “marine fisheries domain” is considered to be one of the most productive areas within the Gulf of Thailand. Based on data from what was then the Department of Fisheries, FAO estimated about 5 000 motorized fishing vessels to be operating in this area and average marine capture fisheries landings to be about 44 000 tonnes per year.$^1$ Though acknowledging that the available information on the marine capture fisheries sector is insufficient, this same FAO publication underlines the general assumption that the marine component of the fisheries sector in Cambodia is not nearly as important as that of the inland component. The reasons for this include a consumer preference for inland fish species and the relatively small fish production from marine areas – about one-tenth of all fish production.

The assumed relative unimportance of the marine fisheries sector is underscored by estimates of the number of people involved in marine fisheries to be just about 10 percent of the coastal population, or 10 000 people engaged in fishing, gathering, processing and marketing. But according to Gum, 2001 (cited in Tana 2002):

“The official catch data collection system for fisheries is clearly inadequate for resource management purposes. Although there are positive initiatives to address these issues for inland fisheries, there are no plans for similar initiatives on the coastal zone. The coastal zone statistics only report on the fishing effort (by boat and gear) for taxable gears which are largely confined to inshore waters. The offshore fishery is largely fished by international fleets of which there are no estimates of effort, catches or revenue collection. These fleets largely land their catch in their home ports and their fishing operations in Cambodia are believed by many to be controlled by Cambodian security forces. There is, thus, compelling evidence that the official catches for the coastal zone are a major under-estimation of actual catches and there appears to be no means to estimate the composition of the catch of the offshore fishery.”

For many years, these inadequacies of the available information on the marine fisheries subsector have contributed to the relative casualness with which marine fisheries were regarded by authorities and development institutions. It is only in recent years that the fisheries in Cambodia’s coastal and marine areas have attracted the attention of government agencies, such as the Fisheries Administration, and the international donor community, with the realization that the dependence of coastal communities on marine fisheries resources might be much higher than the available data indicate.

The results of the “Strengthening capacity in fisheries information gathering for management” initiative, as summarized below, confirm a far greater role for the marine capture fisheries sector in local coastal economies. This growing interest in coastal and marine fisheries issues is reflected in the rapid expansion of the concept of “community fisheries” as the basis for local, participatory management approaches for aquatic resources in coastal areas.

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2.1 Community fisheries: the Cambodian approach to fisheries co-management

With more than 70 percent of the Cambodian population depending on agriculture, fisheries and the exploitation of natural resources, participatory approaches to the management of forest and fisheries resources have been pursued since the early 1990s. Conflicts over access and user rights to the fisheries resources of the Tonle Sap led to a drastic reform of the sector in 2000, when the Prime Minister requested the Ministry of Agriculture, Forestry and Fisheries to redistribute the fishing lots around the Tonle Sap among small-scale fishers. Consequently, the country’s total of 155 fishing lots (953 740 ha) were reduced to 82 fishing lots (422 203 ha) providing 56 percent of fishing lot areas to the poor people as community fisheries.

Table 1 Development of community fisheries (CFs) in coastal areas since 2001

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<thead>
<tr>
<th>Province</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>No. of CF member-households 2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sihanoukville</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>12</td>
<td>17</td>
<td>20</td>
<td>1 696</td>
</tr>
<tr>
<td>Koh Kong</td>
<td>3</td>
<td>3</td>
<td>6</td>
<td>6</td>
<td>9</td>
<td>9</td>
<td>951</td>
</tr>
<tr>
<td>Kampot</td>
<td>1</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>10</td>
<td></td>
<td>1 428</td>
</tr>
<tr>
<td>Kep</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>160</td>
</tr>
<tr>
<td>Total</td>
<td>9</td>
<td>16</td>
<td>20</td>
<td>27</td>
<td>35</td>
<td>40</td>
<td>4 235</td>
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Since then, community fisheries have become the core institutional mechanism to ensure stakeholder and resource user participation in the management and conservation of fisheries resources. This was legally formalized in 2005 with the passing of the “Royal decree on community fishery management” and the “Sub-decree on community fisheries”.

By 2005, 35 community fisheries with over 4 000 member-households had been established in coastal areas. The average household size of just above five indicates that the previously identified number of 10 000 people estimated to be involved in fishing is not even close to the actual number of coastal dwellers who depend on fishing activities for their livelihoods. Indeed many resource users are not members of any community fishery.

Legal framework for community fisheries

Royal decree on the establishment of community fisheries

Article 1:
All Khmer citizens have the right to join together to establish community fisheries in their own local areas, on a voluntary basis and to take the initiative to improve their own standard of living by using fisheries resources sustainably to contribute to economic and social improvement and poverty alleviation.

The sub-decree on community fisheries states the objectives of community fisheries as:
- to manage the inland fisheries areas where fishing lots have been cancelled or released in part, protected fishing areas, inundated forest and mangrove forest areas, and the marine fisheries domain;
- to manage fisheries resources in a sustainable manner and ensure equitable sharing of benefits from fisheries resources for Khmer citizens;
- to increase Khmer citizens’ understanding and recognition of the benefits and importance of fisheries resources through direct participation in managing, using and protecting fisheries resources;
- to provide a legal framework that makes it easy for Khmer citizens living in local communities to establish community fisheries; and
- to improve the standard of living of Khmer citizens in order to contribute to poverty reduction.
Not all of these community groups refer to themselves as members of a community fishery. Often they are called a “natural resource management committee” or a “village management committee”. In Sihanoukville, all community fisheries go by the name “community fisheries and mangrove protection areas”. This variety of names reflects the diversity of support agencies, projects and donors which were involved in creating these community fisheries. It also shows the lack of guidelines and clear directions for establishing community fisheries before 2005, when the framework was created. However, what all these community organizations have in common is the goal of improving the livelihoods of their members through conservation and responsible management of the aquatic resources in their respective areas.

2.2 Approaches to information generation in Cambodia

It is against this background that the objectives and activities for the Cambodian part of the “Strengthening the capacity in fisheries information gathering for management” initiative were formulated. As a result of Cambodia’s rapid economic change and development, new economic opportunities are arising in fast-growing urban centres like Phnom Penh and Siem Reap, and traditional and often subsistence-based rural economies are being transformed by increasing integration in national and even international markets and the related commercialization this involves.

Rural communities depending on traditional livelihoods such as small-scale coastal fishing are in danger of being left behind as the country’s economy changes. Community fisheries institutions can play an important role in checking these trends of increasing livelihood insecurity and vulnerability by improving the management of aquatic resources through involvement of the resource users.

Acknowledging the importance of involving local stakeholders in resource management, the initiative sought to lay the foundation for a continuous dialogue among stakeholders for development and adjustment of planning, management and the required legal instruments to ensure a sustainable use of the available fisheries resources.

Building on and using the institutional framework of community fisheries, methods were to be explored that could be realistically employed for a sustainable and appropriate information generation system for the management of coastal marine fisheries.

Thus, rather than actually generating new data and information about the sector and in the spirit of its title “Strengthening capacity in fisheries information gathering for management”, the initiative addressed these issues by means of the following specific objectives:

- to enhance dialogue among policy-makers, the policy-implementing agencies and fishers to formulate proper, clear and feasible policies and management interventions;
- to use resources sustainably through effective coastal fisheries management facilitated by improved information on resource use and users;
- to assess current issues in relation to conflicts in fisheries and the socio-economic status of small-scale fisheries; and
- to obtain baseline data on the catch and effort.

2.2.1 Flow of activities

The activities implemented were geared towards increasing the capacity of stakeholders to generate relevant and reliable information on coastal fisheries and using this to develop management approaches.

The activities basically covered two main themes, both of which were expected to lead to better information for planning and management. These are:
● conflicts and conflict resolution affecting coastal fishing communities and the socio-economic status of coastal fishing communities; and
● coastal capture fisheries baseline assessment.

Under each of these themes, a number of different activities was implemented: inception workshop, training sessions, consultations (data/information gathering) and wrap-up activities, including reporting.

Under the first theme, two background studies of the socio-economic status of coastal fishing communities and conflicts affecting these communities were conducted. The results of these background studies were then discussed with various stakeholder groups to identify approaches that would effectively address the issues identified.

Under the second theme the initiative sought to address the lack of reliable information about the current status of coastal fisheries resources by means of a coastal fisheries baseline assessment. Through the development and use of a logbook, basic information about current fishery production, fishing methods and effort, the initiative sought to improve the information base for fisheries management. Workshops with different stakeholders on both the national as well as the local level were held to draft a logbook and develop mechanisms for its application. The logbook was then to be tested and used during a one-year data collection period for a coastal fishery assessment.

2.3 Achievements and results

From the early stages of its inception, the initiative was developed with a strong orientation on processes, as expressed by goals that focused on promoting a dialogue among fishery stakeholders. Initiating processes for improved fisheries management and laying the foundation for a continuation of these processes beyond the initiative’s immediate timeframe were considered more important than the production of tangible outcomes in terms of data and information collection, with these being considered a welcome secondary outcome of the initiative. In other words, unlike conventional approaches to improve fishery related statistics, the initiative focused its attention on people, not on numbers. The results of this approach are difficult to quantify and measure. However, the initiative significantly improved the quality of stakeholders’ knowledge and understanding of the sector and the forces that drive coastal fisheries processes. This is most evident from participants’ views and opinions expressed in various workshops and consultations. These reveal deeper insights into the socio-economic parameters of coastal fisheries and the conflicts affecting them, the appreciation of actively involving resource users in the generation of management-relevant information and the recognition of stakeholders’ capacities and limitations for increasing their engagement in fishery resources management.

2.3.1 Socio-economics of coastal fisheries in Cambodia: background study I

To provide a base and some orientation for planning and implementing initiative activities, the initiative commissioned a background study on the socio-economic status of coastal fishing communities, including health and HIV/AIDS. This study was not expected to generate really new information about socio-economic issues in coastal communities, but to compile and summarize information from existing sources, both published and unpublished. One of the intentions of the study was to draw the attention of fisheries officers and project staff to other than fishery biological information. Thus, a trained marine biologist and not a sociologist or economist was selected for doing this study.

Thus, this background study may not provide an in-depth look and a detailed analysis of the pressing socio-economic issues that impact coastal and marine capture fisheries, but a basic understanding of community problems and their possible solutions has been achieved.
A census conducted in 1998 put the population of Cambodia’s coastal provinces at about 840,000, with the average household size of just above five persons and population densities ranging from 178/km² to only 12/km² in Koh Kong.

The background study sketches a picture of a rural populace for which agriculture and fishing are the main livelihoods. The majority of coastal households depend on several sources of income, with waged labour providing for less than 20 percent of their income. Fishing and related activities were identified as the dominant livelihood but individual households usually have three to four different sources of income. The high dependence of coastal communities on the exploitation of natural resources, particularly fisheries and agriculture, and the lack of formal employment opportunities in the secondary and tertiary sectors, increase the vulnerability of their livelihoods, especially as the resource base is declining. The expansion of a cash-based economy and the growing demand for waged employment and the resulting increase of relative poverty in coastal areas has caused migration for employment into urban centres like Phnom Penh, Sihanoukville and even Siem Reap, were the economy is increasingly expanding into secondary and tertiary non-agriculture based industries such as garment production and tourism. At the same time, communities depending on coastal natural resources for their livelihoods are increasing their efforts to use these resources to maintain, at least, their livelihoods within the expanding economy.

### Conflicts in Cambodia’s coastal fisheries: background study II

This increasing competition for coastal natural resources is one of the root causes of growing conflicts in Cambodia’s coastal fisheries, which were outlined and discussed in a second background study undertaken by the project: “Conflicts among competing fishing groups and other users in the coastal area of Cambodia”. The results of this study are based on a review of existing information contained in both published and non-published materials, as well as interviews with key persons. The results were then discussed and verified during a workshop with community representatives and other stakeholders.

Conflicts may be a deterrent, weakening the motivation of stakeholder communities to engage actively in fisheries management. It is necessary to understand the existing conflicts that affect coastal communities to find remedies that seek not just to remove the symptoms of these conflicts, but also to remove their root causes.

The study identified various levels and lines of conflict both within coastal communities (domestic conflicts) and between coastal communities and outsiders and/or foreign fishing vessels.

1. **Foreign fishing vessels operating in Cambodian waters.** Generally, coastal communities and stakeholders consider this issue as the prime source of conflict in the coastal fisheries. These foreign-financed and foreign-owned boats are usually equipped with fishing technologies that domestic vessels find hard to compete with. As outlined in the report, throughout the 1990s confrontations (sometimes resulting in death) between authorities and poachers, fishers and pirates, Cambodian fishers and foreign fishers were common in offshore waters, especially in those areas.

### Table 2 Population in coastal areas

<table>
<thead>
<tr>
<th>Location</th>
<th>Area (km²)</th>
<th>Population</th>
<th>Density</th>
<th>Average household size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cambodia</td>
<td>181 035</td>
<td>11 426 223</td>
<td>64</td>
<td>5.2</td>
</tr>
<tr>
<td>Kampot</td>
<td>4 873</td>
<td>527 904</td>
<td>108</td>
<td>5.0</td>
</tr>
<tr>
<td>Koh Kong</td>
<td>11 160</td>
<td>131 912</td>
<td>12</td>
<td>5.3</td>
</tr>
<tr>
<td>Sihanoukville</td>
<td>868</td>
<td>155 376</td>
<td>179</td>
<td>5.5</td>
</tr>
<tr>
<td>Kep</td>
<td>336</td>
<td>28 677</td>
<td>85</td>
<td>5.3</td>
</tr>
<tr>
<td>Total coastal areas</td>
<td>17 237</td>
<td>843 869</td>
<td>49</td>
<td></td>
</tr>
</tbody>
</table>

A census conducted in 1998 put the population of Cambodia’s coastal provinces at about 840,000, with the average household size of just above five persons and population densities ranging from 178/km² to only 12/km² in Koh Kong.
that were the subject of territorial disputes between Cambodia and neighbouring countries. Many local fishers were compelled to give up their occupations or move to nearshore fisheries for security reasons. As a result, the number of small trawlers and gill netters increased enormously, even though the fisheries law banned trawling in the shallow, nearshore waters.

2. The background study identified various domestic fisheries conflicts and categorized these as follows:

a. *Inshore fishers versus offshore fishers.* When medium-scale fishers (with boat capacity between 35 and 50 HP) lost the competition with larger boats of more than 100 HP in the offshore fishing grounds, they began fishing in nearshore areas, where small-scale fishing gears are stationed (traps, gill net, etc.). The main conflict arises from the destructive impacts the fishing gear of the bigger boats have on the stationary gear deployed by small-scale fishers.

b. *Capture fisheries versus aquaculture.* This conflict is largely restricted to areas in Kampot province and in the resort city of Kep where seaweed production (*Kappaphycus Cottonii*) is carried out. The expansion of Cottonii in these areas has narrowed the fishing grounds of small-scale fishers.

c. *Local fishers versus foreign fishers.* This is basically a conflict between community fisheries members and other resource users who are not members of the community fishery and, more often than not, ignore the fisheries management and resource protection regulations of the community fishery. Often, there is no support from local authorities to enforce their by-laws, which seek to regulate the resource use practices in their respective community fisheries management areas.

In analyzing the root causes of the rise in the number of these conflicts in recent years, the report draws the following conclusion:

- There is a link between poverty and conflict – the higher the level of poverty, the greater the potential for conflict as fishers compete to capture scarce resources to meet growing financial difficulties.
- On the surface, conflict may appear to be over allocation issues, but the root cause of the conflict is often far more complex. Cambodia's coastal fisheries conflicts are very often a result of institutional failure to mediate conflicting needs and perceptions.
- The main conflicts were caused by the lack of law enforcement, as illegal fishing activities in shallow water are often tolerated or even actively supported by powerful interests in the government. Foreign fishing vessels were reported to be secretly supported by similar powerful interests in the government.
- Small-scale fishers and community fisheries members are the least consulted local stakeholders about local affairs and development directions. Thus, investment decisions and local development priorities,
fisheries policies, public resource use preferences and budget allocation decisions usually do not reflect the actual needs of fishing communities or are made without considering how fisheries activities are impacted by externalities relating to the environment, livelihoods and health.

Effectively addressing these conflicts will require the increased involvement of local resource users in local decision-making processes. Community fisheries members need to play a larger consultative role in local policy formulation and development. In places where local administration officials and decision-makers are inclined to pay less attention to the needs of community fisheries members and other local resources users, there needs to be a pro-active push for greater local representation. This requires capacity building efforts that enable local resource users and community fisheries members to present their case to the respective authorities effectively and convincingly. And the authorities in turn need to understand the importance of addressing these needs in local development planning and decision-making. Conflicts over coastal resources can have a significant impact on development initiatives and poverty reduction strategies because a large number of fishers and households rely on the resource.

2.4 The long and winding road to data collection

The availability of reliable and relevant information about the sector and the status of resources is one of the core preconditions for informed decision-making. Although the two background studies and the related consultations and workshops greatly enhanced the understanding of problems and issues, these are still described by general and sweeping statements about the degradation of coastal resources, declining fish catches, increasing numbers of fishers and growing poverty among coastal dwellers. These statements are not very helpful and may even prove counter-productive if not supported by evidence.

The initiative sought to address this issue by generating information about the coastal marine fisheries sector by means of a coastal fisheries baseline assessment that would collect data on fisheries production, fishing gear, fishing effort and stakeholders. These data could be used to prepare development and fisheries management plans, with a focus on community fisheries.

Originally, the initiative chose a rather conventional approach to the planned coastal fisheries baseline assessment with the aim being to improve national fisheries statistics. A workshop was organized in which representatives and staff from the Department of Fisheries, the Community Fisheries Development Office, the Marine Inspection Unit and other national organizations discussed the scope of the information required from commercial fishers and the possible structure of the data gathering process. A draft logbook that required fishers to identify and record, among other data, their daily catches of 50 species of fish, shrimps and crabs was reviewed and, following recommendations from the workshop, simplified. After further discussions between concerned agencies and fisheries officers about the data collection mechanisms, it was then decided to move the focus of the data collection to community fisheries. With this new focus, the initiative sought to support more directly the government policies of sharing resource management authority with local communities to improve small fishers’ livelihoods. The data collection form was further modified to reflect the change from collecting information from individual fishers to community fisheries management areas. This shift also reflects the intention to assist community fisheries members in the generation of information necessary to formulate their community fisheries area management plans, as mandated by the community fisheries law (sub-decree on community fisheries management).

Follow-up consultations with community fisheries members that aimed at improving the draft data collection form (see figure above) according to the needs and capacities of community fisheries, however, revealed that the then existing community fisheries members were just not ready for such a data collection exercise. Two main reasons for this were identified:

1. The proposed data-gathering activities were not seen as beneficial and useful for the community fisheries members themselves. Though the draft community fishery-logbook contained some
explanatory notes about its purpose, namely promoting the development and management plan of specific community fisheries, this was not a sufficient reason for community fisheries members to actually apply even modified data-collection forms.

2. The required effort to collect daily catch information from individual community fisheries members was seen as too onerous. As community fisheries members perceived the data-gathering exercise as being “for the project”, they were not willing to engage in the activity without any compensation or incentive.

Options for addressing these issues within the initiative seemed scarce as the necessary capacity building for enabling community fisheries members to generate information that they can use for formulating their respective management plans goes far beyond some short-term training activities on how to use even the simplest data-collection forms. Going back to the original idea of a coastal fisheries baseline assessment using modified data collection forms and employing enumerators to collect the data was also out of the question because this in no way would contribute to the main purpose of the initiative, which was “strengthening capacity in fisheries information gathering for management.”

While these issues were being discussed and options for constructive and valuable activities for strengthening community fisheries being weighed up, FAO started a technical cooperation programme (TCP) that specifically addressed the issue of “Capacity building for community fisheries management” in Cambodia’s coastal areas. Using and building on participatory fisheries management and planning approaches, this initiative was seen as complementary to the ongoing efforts in strengthening community involvement in local fisheries management.

2.4.1 Engaging community fisheries in generating information: complementary initiatives

In early 2006 the FAO TCP/CMB/3004 “Capacity building for community fisheries management in the Department of Fisheries” started its activities, pursuing objectives that were complementary to those of the initiative “Strengthening the capacity in fisheries information gathering for management” (GCP/RAS/199/SWE). The overall development objective the initiative intended to support was the creation and establishment of “Functioning coastal community fisheries in the coastal areas of Cambodia”.

The initiative was designed with the understanding that there is a positive reciprocal relationship between livelihoods and the extent of people’s participation in managing fisheries resources, i.e. functioning community fisheries. With this, the initiative shares common grounds with the GCP/RAS/199/SWE and numerous other initiatives in establishing sustainable and responsible resource use systems in coastal areas to improve people’s livelihoods. Whereas many of such initiatives aim their efforts directly at local communities, this initiative recognized the important role local fisheries officers can and need to play as facilitators of processes that lead to improved livelihoods and functioning coastal community fisheries.

The initiative thus focused on two main areas, considered as crucial for achieving the overall goal:

1. capacity building for local fisheries officers in participatory approaches to fisheries management; and
2. community fisheries management planning.

This initiative and the initiative to improve fishery information both share the objectives of improved communication and cooperation between local stakeholders and institutions in fisheries and aquatic resources management. With the ongoing decentralization processes in Cambodia, local level administration and institutions such as the commune councils and community fisheries organizations play an important role in ensuring a responsible and sustainable use of coastal fisheries resources. Technical support from the Fisheries Administration through its local fisheries officers is crucial to ensuring the success of such local management approaches.
The formulation of their respective fisheries management plans has demonstrated their ability to achieve something useful for themselves and their livelihoods.

It also has led them to realize the importance of having reliable information about themselves and the resources they depend on to present their case to local authorities with confidence. This lesson has become the point of departure for the continued efforts of the GCP/RAS/199/SWE to strengthen local capacity for information generation for fisheries management.

Having realized, that it is not the Fisheries Administration or the FAO project which needs the information, but that they themselves would benefit from having ready access to reliable data about their fisheries, the community fisheries members that were involved in the TCP have expressed their willingness to test and establish simple data collection mechanisms.

### 2.4.2 Trials and tribulations of developing and testing community fisheries-based data collection mechanisms

Following the TCP and based on its outcomes, a workshop with representatives from the 13 community fisheries that participated in the TCP was organized to discuss the importance of basic regular information collection in their respective management areas and what information the representatives of CFs think they need and what data they think they would be able to record.

During this workshop community fisheries representatives expressed their willingness to collect basic information about their respective fisheries as they have become aware of the benefits of having such data as a basis not only for their fisheries and resource management efforts, but for supporting their interactions with local authorities, the Fisheries Administration and even international donor agencies that may be interested in supporting them.
The initiative facilitated another round of consultations with individual community fisheries members, during which the conclusions of the workshop and the type of data to be collected were confirmed. However, though all agreed in principle with the outcomes and results of the discussion during the workshop, many members lacked the confidence to commit themselves to any regular data collection mechanism, as they were not sure about the time and effort involved. They also thought it would be difficult to summarize and interpret the data collected. To address these concerns and dissipate these worries, a training course was organized during which community members simplified the data collections sheets into formats they could easily understand and work with, and basic and simple ways of tabulating the data into totals and means were demonstrated and practiced.

The data collection forms finalized during the training course provided a framework for tabulating daily catch of individual fishers into total daily catch that could then be summarized into monthly and yearly catch records for the community fisheries. Additionally, fish traders who buy the fish from the community fisheries members agreed to record the daily amount of fishery products they purchase from them. By comparing this data with those recorded by the community members, the amount of fish that is consumed in the community fishery could be estimated.

Together with project staff and other representatives from the Fisheries Administration, they identified a basic set of data considered useful for their purposes, if collected on a regular basis. These include:

- number of community fishery members;
- total catch and species composition of catch;
- time spent on fishing operations; and
- number and type of fishing boats and gear in the community fishery.

After the workshop, participants agreed on this minimum set of data and they decided to discuss this and the methods of collating the data further with their respective community fisheries members because they felt they needed their support to ensure a regular data collection routine.

These four forms are intended as guidelines and illustrations for data collection. Each community fishery association that actually engages in data collection will have to find its own way of administering these forms to collate the required information.
Participants thought that these forms provided a simple-to-use means of collecting the required data and all agreed to use them. Accordingly, after the training course the participating community fisheries members started a data collection trial phase to test their capabilities to gather the data as indicated in these forms.

2.4.3 Data collection process and results

The chiefs of the participating community fisheries agreed to manage and organize the data recording. They selected community members who were then asked to record their daily fishing activities. Throughout this data collection trial, the national consultant and national focal point from the Fisheries Administration, together with provincial fisheries officers consulted with the community fisheries members about the progress and problems they were facing in using the data collecting forms for regular data recording.

This process resulted in a number of partly filled-in data-collection forms that were presented during a final evaluation workshop; this showed that they actually tried to collect some data, but could not ensure some kind of regularity in getting fisheries-related information from their respective community fishery members. The reasons for this failure were identified as lack of time and experience, insufficient understanding of the recording requirements by the fishers, unwillingness of the fish traders to participate and the lack of monetary incentives to ensure regular data collection.

A further discussion with community fisheries leaders showed that they clearly understood the importance of having some basic information about their respective fisheries, such as fishing activities, catch and status of resources. However, the process and methods used had some weaknesses that prevented a satisfactory amount of data being collected. The most critical factors responsible for this were identified as:

- no financial benefit and incentive for the data collector;
- traveling distances within the community fisheries were too far to allow regular visits to individual fishers and community fisheries members;

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- no financial benefit and incentive for the data collector;
- traveling distances within the community fisheries were too far to allow regular visits to individual fishers and community fisheries members;
● community fisheries leaders are too busy with other administrative work to spend time on data collection;

● fishers do not understand the importance of providing such information on their catches and fishing activities; and

● no immediate and direct benefit from collecting such fisheries information.

This list reveals some of the underlying root problems that need to be addressed to strengthen the functions of community fisheries.

Not mentioned in this list, but obvious from the discussions, is that the data collection process and mechanism is too “paper based” and formal. The formal nature of the process is one of the reasons for people being apprehensive about participating in generating fisheries-related information that may be useful for management and therefore needs to be modified.

A core problem is that the community fisheries leaders who were involved in the initiative and participated in the workshop were unable to share their understanding of the importance of a sound knowledge-base for the improvement of the living conditions of their members with these members. Further discussion of this issue revealed the need to strengthen and improve the leadership skills of the community fisheries leaders and committee members. Further awareness creation efforts are needed to ensure that not only the community leaders, but also the community members understand the need for having a regular data collection process. It is obvious that for both community leaders and members, the collection of such data is not a priority issue. Though its importance is recognized, it does not generate immediate and tangible benefits to the community fisheries members and thus often is forgotten or overlooked among the many other issues the community leaders are dealing with on a daily basis.

The discussion during the final workshop showed that the approach chosen for collecting some basic fisheries-related information on community fisheries is valid and has the potential to be developed into a regular activity. Though the participants from the community fisheries listed a number of reasons for not being able to pursue the data collection more regularly, they all expressed their willingness to try to continue with the process, as they are aware that they will need such a knowledge base for effectively managing their community fisheries and their aquatic resources.

The initiative itself faced delays that were caused by the departure of the counterpart staff from the initiative. The data collection trial that was conducted during the extension phase of the project was originally planned to prepare the way for a 12-month data collection process. The discussions during the workshop make it safe to assume that the participating community fisheries members would have been able to develop workable and appropriate mechanisms for such regular data collection. This trial phase established a basis on which the community fisheries members could continue – it is unfortunate that this happened towards the end of the initiative, as all involved actors will find it difficult to continue with these activities without the supporting framework the initiative provided. However, the fact that both community fisheries members and local fisheries officers committed themselves at least to try to continue this work, can be seen as an indicator of the success of the initiative with regards to initiating new ways of thinking and communicating within community fisheries organizations as well as between community fishery members and officers from the Fisheries Administration.
2.5 Beyond community fisheries: information about the small-scale and medium-scale commercial marine capture fisheries

The concept of community fisheries constitutes the core approach or key by which the Cambodian government seeks to ensure sustainable resource use and livelihood development for fishing communities and other aquatic resource users. Thus it seemed only natural for this initiative to follow this concept and focus its efforts on promoting and strengthening community fisheries.

However, during the project implementation and through coordination and feedback from other projects such as the above-mentioned TCP/CMB/3004, the project team and Fisheries Administration realized that the current practices of establishing and supporting community fisheries leaves out a huge section of the fisheries sector, as small- and medium-sized commercial fishers have no incentive to join community fisheries and engage in activities associated with them. Thus only a small part of coastal fisheries will be addressed and covered if the focus is solely on community fisheries. Successes and positive impacts of community fisheries-based activities may even be dissipated by the resource use practices of those sections of the fisheries that are not organized into community fisheries.

It was therefore decided to organize scoping meetings (symposia or public hearings) with members of this subsector to seek some feedback. One such meeting was held in Sihanoukville on 13 November 2007 and the second meeting was held on 21 November in Koh Kong. As these meetings were intended just to start some form of dialogue between fishery officers and representatives of the medium-scale and small-scale fishery subsector, no specific outputs were expected. However, the concerns raised by the participants of the meetings confirm earlier observations and assumptions and allow some provisional conclusions and recommendations. First, the small-scale and medium-scale commercial fisheries subsector has so far been neglected by fisheries authorities in their efforts to establish co-management mechanisms for the management of fisheries resources. Second, the representatives of the small-scale and medium-scale fishers brought forward six main issues they consider to be very important and these are highlighted in the following paragraphs.

First, the sharing of fishing grounds with foreign fishing boats and the intrusion of foreign fishing vessels into Cambodian waters was seen as a major problem. The participants highlighted the fact that it is very difficult for them to compete with these fishing boats, as the foreign boats have better and more powerful fishing gear. Addressing their complaints about the lack of support from local fishery inspectors and enforcement officers, the representatives of the local fisheries office explained that foreign fishing vessels do not recognize the authority of Cambodian fisheries inspectors and thus it is difficult to control them. They reported several cases of Cambodian officers being taken into custody by foreign fishing vessels and handed over to the police of neighbouring countries.

Second, many of the participants maintain that the fishing power of the foreign fishing boats is responsible for the degradation of fishery resources. According to the participants, this is reflected in a decrease in the quality of catch (species composition and size of fish) and a decrease in the overall catch.

Third, there is a lack of local marketing opportunities and a need for small-scale and medium-scale fishers to sell their catch through Thai traders on the Thai market. As transportation of their products to Phnom Penh or other Cambodian markets is too difficult because of the road conditions and distance, lack of facilities to keep the catch fresh etc., they have to sell their catch to Thai traders who are not willing to increase the price for the caught fish.

Fourth, the problem of not being able to control the price of fish is compounded by the high fuel prices. Some fishers seem to have given up fishing as the production cost is too high and cannot be covered by the product of their fishing efforts.
Fifth, to help them deal with the increased production cost and decreasing margins, they would like the government to reduce the high taxes. During the discussion they agreed that paying taxes is necessary for the government to provide the assistance and services the fishers expect from the government. However, the lack of support from local and national fishery authorities with regards to illegal fishing activities by foreign fishing boats in their view justifies their request for a reduction in taxes.

Sixth, apart from these taxes they often have to provide fuel and part of their catch to the Cambodian navy.

Further discussion of these issues with the representatives from the Fisheries Administration and the International Consultant revealed the lack of even the most basic information about this subsector, as both local fisheries officers as well as the fishers could not even agree whether or not the number of fishers is increasing.

Agreeing on the importance of being able to exchange views and concerns about the fishery and to improve small-scale and medium-scale fisheries, all participants concurred that the Fishing Authorities and FAO should consider options for supporting and facilitating the continuation of this dialogue between fishery authorities and fishers, which may lead to the establishment of an association of small- and medium-scale fishers.

2.6 Conclusions: strengthening fisheries co-management in coastal Cambodia

Cambodia succeeded in “strengthening the capacity for fisheries information gathering for management” by fostering a dialogue between national and local fishery stakeholders and between fisheries officers and resources users about issues affecting the sector and the concerns and problems of local communities. This communication process may not yet have resulted in the generation of new information through the collection of fisheries-related data in coastal areas, but it vastly increased various stakeholder groups’ understanding of each other’s needs and positions with regards to the fisheries sector and its management. Fisheries officers on the national and the local levels have realized that they have to cooperate closely with resource users and organizations such as the community fisheries organizations. Though often very motivated, community fisheries members generally lack the knowledge and skills needed to take up the responsibilities of resource management, as given to them through the community fisheries laws. Both stakeholder groups, i.e. fisheries officials and local fishers, have, through this initiative, become aware that their relationship is not a one-way-road, with one party being at the receiving end and the other being at the giving end, but rather an alliance of partners pursuing the same goal of strengthened local livelihoods through improved management of fisheries and other aquatic resources.

Both the community fisheries members as well as Fisheries Administration officers have gained a deeper understanding of what is required for the responsible management of coastal fisheries resources, but only the future will tell how these new insights will be translated into daily practice or turn into a new way of life in Cambodia’s coastal areas.
Information needs and marine protected areas: for sustainable management of inshore reef fisheries in Timor-Leste
3 Fisheries management issues in Timor-Leste

Among the four countries that were part of the “Strengthening capacity in fisheries information gathering for management” initiative, Timor-Leste is somewhat unique. Being a very young country, Timor-Leste is still looking for suitable approaches and ways to sustainably manage the fisheries sector. Following succession from Indonesia, there is no functioning domestic commercial large-scale fishing industry in Timor-Leste. Thus, the country is looking to neighbouring countries such as Indonesia and Australia, and even as far away as Thailand, to enter into agreements with these countries to ensure the use and exploitation of its offshore fisheries resources in a sustainable way.

The still pristine coastal resources offer income and livelihood opportunities for coastal dwellers that may quickly dissipate if the emerging small-scale coastal fisheries are not regulated and managed through the involvement of local fishers. However, there is virtually no infrastructure in place to ensure the generation of information and its use for management of the sector. This poses a tremendous challenge for the fisheries management authorities, as even the simplest and most basic information about the status of Timorese fisheries is lacking. Thus, including Timor-Leste in this initiative was done with the intention of creating an opportunity for fisheries administrators in that country to experiment with various forms of information generation and to take the first steps in initiating stakeholder involvement in formulating and developing approaches for the conservation and management of small-scale fisheries.

3.1 Timor-Leste’s fisheries sector: what did we know before the initiative?

Timor-Leste has a coastline of about 700 km with the exclusive economic zone (EEZ) covering approximately 75 000 km². Although this fishing area is relatively small it is seen as having the potential to produce valuable protein and to provide employment, significant income earning opportunities and foreign exchange from fish exports.

Fishing activities are largely restricted to the narrow shelf area and focus mainly on the reef areas. This coastal fishery did not seem to be very heavily exploited at the beginning of the activities, although not much information was available on the status of fish stocks. The number of fishers is relatively low. Estimates prior to the initiative that are used till today, show that there are about 4 900 artisanal fishers active in coastal capture fisheries in all coastal districts, with close to half active in Dili and Atauro. About 400 use motorized vessels, and the remainder is considered to be artisanal fishers using non-motorized vessels and outrigger canoes. Actual catches and effort are unknown, but it is anticipated that overexploitation may become an issue in the near future. A study of fishing grounds off Dili in 2003 (Deutsch, 2003) revealed that overfishing might already be adversely impacting fish populations along the north coast. Also, Monk et al. (cited in Trainor and Soares, 1997) indicated that there are signs of overexploitation and declining fish stocks, adversely impacting several economically valuable species in the area.

The centre of the commercial foreign fishing industry is Com on the north coast, though these foreign vessels operate mainly to the south of the main island, in the Sahul Bank area.
Developing and managing Timor-Leste’s fisheries sector need to address two major challenges:

1. developing the coastal reef fisheries in such a way that sustainable fishing levels are not exceeded; and

2. controlling and monitoring offshore fishing activities by foreign fishing fleets and ensuring that these generate benefits for Timor-Leste.

3. Objectives of Timor-Leste’s involvement in the initiative

As pointed out earlier, the general lack of reliable information about the fishery sector in Timor-Leste makes the formulation of fisheries management and development plans difficult, if not impossible. Recognizing the predominantly small-scale nature of the fisheries and the resulting problems in setting up a data collection system to generate reliable information, it was thought that fishers and fishing communities should play a greater role in information generation and fisheries management planning.

Thus, the general objective of the activities in Timor-Leste was to encourage the use of consultations with fishers and other stakeholders to solicit feedback from them for incorporation into the fisheries management planning process.

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The map shows the narrow coastal shelf of Timor island (in purple) and deep water trenches of the Timor Sea (1300 - 3300 metres) offshore the main island, plus the shallow water fishing grounds of Sahul Banks to the south.
More specifically, the planned activities aimed at:

- informing local communities about their responsibilities and rights in relation to coastal fisheries management and obtaining comments and suggestions on the rules and regulations that are included in the new fisheries decree;
- supporting the implementation of the new policy, especially licensing, by effective communication between different levels of stakeholders to assess the best way to implement licensing for artisanal fishers; and
- developing a realistic data collection system for artisanal fishers.

A sequence of activities at the national and local level was initiated that focused on reaching as many local-level stakeholders as possible for establishing some common ground for dialogue and discussion.

### 3.3 The consultation process: talks, actions and results

The core of these activities consisted of stakeholder consultations in all coastal districts of Timor-Leste. The consultations were intended to lead to the development and testing of a mechanism by which fishers and local stakeholders participate in the generation of fisheries-related data and information for fisheries management that would be used to formulate appropriate interventions for the sustainability of the sector.

To prepare for these consultations and provide some background information on the coastal fisheries sector of Timor-Leste, a study titled “Socio-economic issues in coastal fisheries communities in Timor-Leste and priority socio-economic indicators for monitoring sustainable fisheries development” was conducted.

#### 3.3.1 Socio-economic survey of Timor-Leste’s fishery sector

An initial and more detailed look at the fisheries sector in Timor-Leste was carried out by means of a survey of the socio-economic situation of the Timorese fishers in three coastal districts. This survey provides some insights into the current fisheries situation and both identify and confirm some critical issues affecting the sector. Timorese fishers are generally young and rely heavily on fishing as a source of income and food. It must be noted that a high percentage of fishers (90 percent) had fishing as source of 88 percent of total income and 68 percent of their food. Specific measures have to be made to protect their livelihoods. Job opportunities within and outside the villages are limited. As mentioned earlier, the resource condition is perceived to be good, but there are some warning signs indicating that the nearshore reef fishery may already be in decline.

The study points not only to potential threats from overfishing, but wider environmental problems that may cause the degradation of coastal habitats. It specifically refers to the alarmingly high rate of upland deforestation and the resulting silting that may affect nearshore waters.

The study points to the potential impact of semi-industrial foreign vessels within 6 nm from the shoreline on the livelihoods of Viqueque fishers. Though not yet studied, it seems that the offshore areas along the south coast and particularly the Sahul Banks, are important transition areas whose biological features support fisheries production in the nearshore waters of Viqueque. The impact of foreign fishing boats on the fish populations in these areas may ultimately affect the status of the nearshore fisheries in Viqueque. The fish catch of Viqueque fishers already shows that they have a lower catch compared to other districts, despite observing informal rules to regulate their catch. Anecdotal reports claimed that their catches, though not significant, have declined and fishers have problems looking for new fishing grounds. It is for this reason that they (86 percent) have reservations about the establishment of a marine protected area.
The open access fishery entails greater demand for the surveillance of illegal activities, requiring money and resources. There is no current regulation on net mesh size (Deutsch, n.d.) or a demarcation of the area for active and non-active gears operating in the coastal zone (Amaral 2005, pers. comm.). Tara bandu, a traditional system of no-take periods, is in place, but only in some areas. Every district has a number of fishing centres, but not all of these are organized and functioning.

The organized fishing centres set their own rules to regulate fish catches. Stockwell, (2003) and Deutsch (n.d.) suggest the establishment of marine protected areas to protect the resource, but more awareness of the need to protect it is needed at the local level.

Post-harvest and marketing were identified as crucial for the improvement of the sector and fishers’ livelihoods. However, the government’s commitment to support fishers’ quest for good fish markets is hampered by lack of knowledge of the resource composition and sustainable yield quota (Guterres, 2003). There is no available fish catch data in the central office. The traders who have established a strong relationship with fishing centres may have some data, but unfortunately this was not further explored by the socio-economic study. The survey points out the need to establish a catch recording system to ensure a better understanding of the scope and scale of fishing operations and suggests involving the fishing centres in the collection of fish catch data for small-scale fishers in the light of limited personnel at the National Directorate for Fisheries and Aquaculture (NDFA). This involves the standardized collection of information about their daily catch, fishing gear and duration and fishing grounds. The study sees this as one important function of the District Fishery Officers who play a key role in and getting information from the field and disseminating it.

It is in the light of these study findings and recommendations that the ensuing field activities and consultations need to be viewed.

3.3.2 Consultation themes

Following this background study, consultations with fishing communities were held between September 2005 and September 2006 in all coastal districts. These consultations were preceded by a training course on community consultation techniques that improved the communication skills of NDFA staff involved in these activities. The consultations addressed three themes:

1. identification of stakeholder needs and emerging issues in the fisheries sector;
2. information needs and mechanisms to generate this information through data collection; and
3. community-based marine protected areas.

Whereas the first two themes were critical to the original objectives and intentions of the initiative, the discussion of marine protected areas seemingly fell outside the original project scope. However, the establishment of marine protected areas is seen as an important component of the national policy framework for the fishery sector and thus constituted one of the issues the NDFA sought to communicate to fishing communities through this consultation process. At the same time, the establishment of community based MPAs was seen as a tool for promoting community organization and participatory management approaches.

This consultation process was interrupted by the political disruptions and instability that affected the country during 2006 and 2007, which even lead to the destruction of the NDFAs offices. Despite this, NDFA staff and local communities carried on with the planned work whenever circumstances allowed and succeeded in achieving most of the objectives that were formulated at the beginning of the initiative.
3.4 Achievements and results

There is no doubt that the consultation process constituted a productive dialogue between coastal fishing communities and national and local representatives from the NDFA. It allowed government staff to inform communities of key issues in the new fishery law and current rules and regulations. At present, two sets of fishery laws are in effect and need harmonizing: the national fishery law and traditional community fisheries laws. The initiative also allowed staff to understand and appreciate fishers’ problems more deeply. Of particular importance are the poorly developed marketing channels and low prices that fishers get for their fish outside the capital, Dili, where the price for fresh fish can be quite high when it is sold directly to restaurants. In nearly all consultations, fishers raised the lack of clean and hygienic facilities at landing sites for storage, packing and transportation of fish.

3.4.1 Development of logbook for fish catch data collection

Among the more specific achievements of this consultation process is the drafting and testing of a data collection mechanism that, if continued, will provide a first overview of the productivity and diversity of Timor-Leste’s coastal fisheries. In cooperation with other agencies, particularly with UNDP, a fish identification guide was developed that provides a reference for collecting species-wise catch information. This guide, which is printed on laminated cards, contains pictures of nearly 150 fish species commonly caught and marketed in Timor-Leste. To make the guide usable, the community consultations were used to identify the local names of the depicted species. This is an important feature of the guide, as there are about 16 languages and dialects spoken in Timor-Leste. However, for data recording and encoding purposes each species was assigned a code as shown in Figure 3 below.

At the same time, the consultations were used to discuss and develop a kind of logbook that could be used to collect information about the daily catch of individual fishers. Various models of such data recording forms were developed and discussed before a logbook design emerged that seemed to be simple enough to be understood and used by fishers. To keep the logbook simple, the final version focused just on daily records of:

- number and length of fishing trips
- main species caught
- total catch (weight and value)
- total income
- fishing gear used
- fishing area.

A group of facilitators was trained to assist fishers in filling in these data sheets and district fisheries officers were asked to monitor the data collection process; facilitators and fisheries officers regularly went to the fishing villages and worked with the fishers in filling in the form.

A first round of logbook-based data collection was conducted for a 30-day period in July and August 2007; a second round was conducted for 60 days from January 2008 to March 2008. In the first phase of the logbook trial, 187 fishers were persuaded to participate; for the second phase the project team was able to get 654 fishers to participate in this data collection exercise.

The data were encoded into a database and initial summary results calculated (see Table 3). This allowed some tentative conclusions to be reached about the type of fisheries and the actual incomes, e.g. district-wise information on the catch and income generated by the different gear types used by the participating fishers.
Table 3 Summary of data collection results

<table>
<thead>
<tr>
<th></th>
<th>1st phase July to August 2007 (30 days)</th>
<th>2nd phase January to March 2008 (60 days)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of gear used</td>
<td>Total catch (kg)</td>
</tr>
<tr>
<td>Gill net</td>
<td>125</td>
<td>22 096</td>
</tr>
<tr>
<td>Hook &amp; line</td>
<td>83</td>
<td>10 297</td>
</tr>
<tr>
<td>Spear gun</td>
<td>100</td>
<td>3 733</td>
</tr>
<tr>
<td>Fish trap</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

An initial analysis of the recorded data with regards to species composition of the catch is still ongoing. During discussions it was suggested that the figures entered into the database be re-checked as there seemed to be some inconsistencies between the records for each district and the calculated totals.

Feedback from the facilitators, fishers and district fisheries officers suggests that the logbook as such is simple enough for everybody to understand. However, the species identification cards and the codes assigned to each species require too much effort and time to be followed accurately. These cards need to be simplified and reduced to major species groups or common families, to make them useable by fishers and facilitators. Additionally, simple technical requirements need to be in place to ensure some

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4 The complete data sets allow the estimation of CPUE, species composition and income generated for each district.
Among the information and suggestions that go beyond the logbook and data collection, the most notable is the request from all districts to improve fish handling and marketing facilities to enable better use of the catch. These facilities should include fresh water and ice, transportation facilities and places where fish can be hygienically packed before being transported to the markets.

Fishers also need financial support or technical support for better boats and engines and improved fishing gear. Several fisheries officers and facilitators suggested training programmes for fishers that provide skills in fish handling and processing.

3.4.2 Making use of logbooks to collect information from small-scale fisheries

Generally, logbooks are considered unsuitable for monitoring catch from small-scale tropical fisheries because of their complex multi-gear, multi-species and multi-landing sites. The experiment with logbooks in Timor-Leste, however, shows that a well-designed mechanism and community involvement can turn logbooks into an appropriate tool for data collection from this type of fishery.

The positive experiences during the logbook trial phase encouraged thinking about ways to continue with this data collection process, albeit in modified ways. These could include a decentralization of the data collection and analysis process that would: a) reduce the workload at the national level; and b) provide local level stakeholders, particularly the fishers themselves, with an opportunity to see and understand how the information they provide could be useful for them.

There is a need to explore other options to reduce the effort involved and to make the data collected more accurate. These aims could be achieved by selecting a maximum number of days or months during two seasons of the year that would allow the data to represent seasonal variations. For encoding the species-wise breakdown of the catch figures, a compromise has to be found between the need for accuracy and what is possible given the capacities of the fishers and local fisheries officers and facilitators involved.
Following these suggestions, a continuation of the logbook as a data collection tool even for small-scale coastal fisheries, as has been tested by this initiative, seems to be both valuable and feasible and should be pursued by NDFA. A continuation of the logbook data collection efforts would go a long way to addressing the need to improve the knowledge base on small-scale coastal fisheries in Timor-Leste. This would enable NDFA to develop adequate management interventions and investment strategies that will lead to the sustainable use of the country’s fisheries resources and improve the livelihoods of coastal communities.

3.5 Marine protected areas as a tool for fisheries management in Timor-Leste

The establishment of marine protected areas (MPAs) to provide the focus of community-based management approaches for coastal resources has been a central theme of the community consultations that were held in the early phase of field activities in Timor-Leste. These consultations lead to the identification of two pilot sites for the creation of small MPAs; at both sites, MPA development committees have been established and are tasked with pursuing the establishment of MPAs in their respective localities.

This push for using MPAs as a tool for local fisheries management and conservation is backed by the national policy framework for fisheries development, which is currently under preparation. Also, Timor-Leste is part of various international initiatives, which are pushing for marine conservation efforts and the creation of MPAs. Both these international initiatives as well as the community consultations held within the framework of this initiative have created very high expectations about the potential benefits that MPAs can generate. Both NDFA and local communities see MPAs as an answer to all local fisheries and coastal resources management issues, promising increased fish catches and generating income through tourism.

Within the local context of coastal resources and fisheries in Timor-Leste, the potential benefits of MPAs for local fishing communities are, however, highly questionable, unless the development of MPAs is embedded in a comprehensive national policy framework that provides some guidelines for ensuring such benefits for local communities.

The following paragraphs outline both the international as well as the national context of Timor-Leste’s push for establishing MPAs and make suggestions regarding policy guidelines.

3.5.1 MPAs in Timor-Leste: the international context

Timor-Leste is engaged in several regional initiatives that aim at the sustainable management and protection of marine and coastal resources in the region. Notably, these are the Coral Triangle Initiative (CTI), the Partnership in Environmental Management for the Seas of East Asia (PEMSEA) and the Arafura and Timor Seas Ecosystem Action Programme (ATSEA) that is currently being developed under the CTI framework.

PEMSEA and CTI aim at establishing integrated management systems for marine resources to ensure their protection and conservation through sustainable resource use practices. CTI’s objectives include identifying the most important seascapes, implementing an ecosystem approach to fisheries management, establishing marine protected areas, ensuring adaptation to climate change and improving the status of threatened marine species. PEMSEA and CTI identify overfishing as one of the root causes of environmental degradation and declining fish populations in the region; however, in their quest for environmentally sound management practices, they fail to address the factors that are actually responsible for overfishing: fishing capacity and effort. The PEMSEA project document containing over 200 pages, for example, refers to the problems of overfishing a number of times in a situational analysis that provides the basis for the proposed interventions; however, for the remainder of the document there is no occurrence of the word “fishing” and it seems the fisheries sector and concerned stakeholders...
who are responsible for the sector’s management and development are overlooked in the partnership arrangements to be made for managing marine resources and ecosystems.

### 3.5.2 MPAs in Timor-Leste: the national context

The establishment of protected areas in Timor-Leste is rooted in the country’s constitution, which seeks to ensure the protection and conservation of the environment and natural resources of the country.

The establishment of protected areas is seen as an important tool for achieving these constitutional objectives and the creation of the “Nino Konis Santana National Park” is the country’s first attempt to create an integrated framework for protecting the country’s diminishing resources. The park includes 55,660 ha of marine areas and illustrates the need for a cooperative approach to the development of protected areas that includes the National Directorate of Forestry and the NDFA, as well as the development of appropriate terminology that describes the potential diversity of protected areas in the country.

The legal basis for the establishment of marine protected areas are the “General Regulation on Fishing”\(^5\), and the “General Bases of the Legal Regime for the Management and Regulation of Fisheries and Aquaculture”\(^6\).

The Decree Law No. 6/2004 establishes government powers in relation to fisheries, including marine protected areas, which consist of: (a) aquatic natural reserves, adapted for the recovery of fishing resources; (b) national marine parks; and (c) marine restocking areas. It is proposed that fisheries management plans will provide a framework for the detailed management of the areas.

Moreover, the national policy framework for the fisheries sector, which is currently being developed, has the goal of “Conservation and, where practical, restoration or rehabilitation of key aquatic habitats, including mangroves, coral reefs and seagrass beds, to maintain a high level of productivity of the marine environment”.

During the early phase of the project the theme of community-based MPAs was used to initiate a dialogue with coastal fishing communities. Although generally meeting with a positive response, two communities in Batugade and Atauro took this discussion several steps further and created MPA committees that are tasked with leading the process of establishing MPAs in their respective communities.

Both communities have very high expectations of the benefits they will receive from establishing MPAs. These include substantial gains in fisheries production through resource recovery and significant additional benefits through the development of (eco-) tourism. With these extremely high expectations, it seems to be necessary to initiate steps to put such local, community-based MPAs into a different and


more realistic perspective, which simultaneously ensures the interests of local fishers and promotes a conservation-oriented approach to managing coastal fisheries resources. This was done through a national training workshop for NDFA staff and representatives of the two MPA committees from Batugade and Atauro.

3.5.3 Towards policy guidelines for MPAs as tools for fisheries management in Timor-Leste

To provoke some discussion and thinking about their expectations with regards to the benefits of MPAs, this workshop started off with a very critical review of potential impacts of MPAs. It is important to note that the current understanding of MPAs in Timor-Leste is that of small nearshore areas which are fully closed to any fishing or other human activities and usually in the range of 20 to 50 ha in size. Involved stakeholders may prefer less stringent levels of protection for MPAs, but currently the goal of NDFA and the MPA committees is to establish fully closed areas or fish sanctuaries.

Fig. 4 Aerial view of the Nino Konis Santana National Park land and marine boundary, which is three nautical miles from the coastline

During the workshop, the potential positive environmental benefits of MPAs with regards to resource recovery and build-up of biomass and biodiversity were discussed, as properly designed MPAs often house a greater diversity of marine life forms and larger fish than the surrounding waters. However, the socio-economic benefits these biological gains might generate for the fishers in the area are questionable. Studies of small, community-based marine reserves in the Philippines showed that positive biological impacts are often insufficient to create socio-economic benefits that would entice local fishers to sustain management efforts for such an MPA over an extended period of time7.

The workshop sought to create some awareness that such small community-based reserves do not address many of the root problems that cause resource degradation. Indeed, the closure of such areas to fishing does not reduce fishing effort and capacity, nor can it significantly contribute to building up local biodiversity and fish stocks. If overfishing is the cause of resource degradation, it is essential to

formulate management systems that reduce fishing effort, as closed MPAs would just relocate and concentrate the existing effort in a smaller, unprotected area. Moreover, on their own, such small reserves cannot mitigate impacts such as pollution and erosion siltation on coastal resources and habitats.

It is important for NDFA and coastal communities to realize that to make such MPAs successful and beneficial they need to be part of an integrated management plan that includes the closed area as the core of a wider area in which various management rules apply.

**3.6 Policy guidelines for managing Timor-Leste’s coastal fisheries with MPAs: some initial considerations**

During the training workshop on MPAs, several guiding principles for MPA development in Timor-Leste were formulated and these can form the basis for policy guidelines for using MPAs as a management tool for fisheries management.

1. The establishment of MPAs in Timor-Leste constitutes an integral part of international programmes and national development policies. Primarily aimed at conserving and protecting critical coastal habitats such as mangrove forests, seagrass beds and coral reefs from degradation, the NDFA plays a crucial role in ensuring that MPAs are designed in such a way that they serve the interests of local fishing communities.

2. It is proposed that the currently planned MPAs should be small (about 20 to 50 ha) closed areas, that on their own would not contribute much to either building up local fisheries or preserving critical local coastal habitats.

3. To redress the degradation of local critical habitats such as mangrove areas or coral reefs, they need to be integrated into a wider coastal resources management programme that addresses terrestrial issues such as waste management and pollution, deforestation and sedimentation.
4. In this context, the proposed closed “sacred”, “not to be touched” areas can be more important for community organization and awareness building on environmental and fisheries-related issues than actually improving the ecological conditions of coastal habitats and the status of fish stocks. But the motive of protecting such a “sacred” area can be used to introduce the idea of additional fisheries and environmental management mechanisms in the surrounding areas to ensure these areas are really protected.

5. As such they would constitute the core areas of wider or extended protected areas in which several levels of protection and fishing rules and regulations apply. To describe such a hierarchy of protected area from “fully closed” to “open” areas where certain management rules apply it is important that Timor-Leste develop its own local terminology and definitions of protected areas.

6. To ensure the benefits of MPAs for fisheries, an appropriate system for fisheries management needs to be established. This should encompasses not only various sets of rules and regulations but, equally important, a monitoring, control and surveillance (MCS) system that enables all involved stakeholders to monitor fishing operations, resource use practices and their impacts on local marine resources continuously.

7. As MPAs, as such, do not address fishery issues such as fishing capacity, and relocate fishing effort rather than reduce it, the rules and regulations mentioned above need to include measures to manage fishing capacity.

8. With such measures in place, a total and permanent closure of fishing grounds should be reconsidered, as the cost of maintaining and enforcing such a closure may outweigh the benefits derived from closing them to fishing. Restrictions on destructive fishing practices such as the ban of certain gear types and fishing implements may be sufficient to protect critical coastal ecosystems, and at the same time allow fishers to continue generating income and livelihoods from fishing.

Fishing within the proposed MPA at Atauro Island
These key principles of MPA establishment in Timor-Leste should be developed into a set of policy guidelines that provide some direction for NDFA and local communities when they pursue the issue of MPAs within national or international initiatives. However, this requires that responsible actors and institutions such as the NDFA realize that MPAs are not the panacea for all fisheries and coastal resources management related issues; more awareness creation and capacity building for fisheries management are needed to generate this understanding and to avoid future disappointments if the currently high expectations from MPAs are not met.

3.7 Conclusions

Timor-Leste’s efforts to engage fisheries officers and local fishing communities in a dialogue about appropriate approaches to developing and managing the fisheries sector were successful in that they created an atmosphere of increased trust and cooperation between all stakeholders.

Fishers are willingly contributing to the logbook-based data collection effort and fishing communities are getting involved in discussing management approaches for the fisheries sector. At the same time NDFA has a much improved understanding of the problems and needs of the sector and the people engaged in it.

The challenge lies in maintaining the momentum generated by this initiative. Timor-Leste’s increasing involvement in international and regional initiatives such as the CTI may provide the required framework and motivation to continue the dialogue among fishery stakeholders.
Understanding the issues: Challenges to reduction of fishing capacity in the Gulf of Thailand
4 Thailand’s fisheries

Unlike the fisheries of Timor-Leste and Cambodia, the fishery sector in Thailand is well studied and production trends well documented; the most important trends and features of the sector are summarized here to explain the different approach Thailand has pursued within this FAO initiative.

Thailand’s overall fisheries production (freshwater and marine, capture and culture) has grown impressively since 1960 and now supplies a population in excess of 60 million, as well as huge lucrative export markets. Nationally, fisheries production is still increasing at an impressive rate (see Fig. 5).

![Graph showing Thailand's fisheries production from 1950 to 2005](source FAO country profile)

However, this production rise is because of the rapid growth of aquaculture. Indeed, production from Thailand’s capture fisheries (marine and freshwater) has been declining since 1996 (see Fig. 6). This is a worrying trend not just for Thailand’s capture fisheries, but also for aquaculture, which depends on capture fisheries for feed and, in some cases, seed. Aquaculture in the region has become efficient at producing high quality bulk species and many fishers now blame fish farming for the low prices that they now get for their wild caught fish. The recent trend of “farming up the food chain” has captured higher-value fish markets in many areas and ironically is helping drive the trend of “fishing down the food chain” that now typifies many coastal fisheries.
4.1 The Gulf of Thailand fishery

The Gulf of Thailand (GOT) is classified as a large marine ecosystem (LME) and covers an area in excess of 350 000 km². It is characterized by high primary productivity, now boosted by domestic, agriculture and aquaculture runoff that has enriched the inner gulf areas to the extent that cases of algal blooms, oxygen depletion and food poisoning have increased in number dramatically in recent years. Species harvested include crabs, lobsters, rays, sharks and small pelagic fish species, including anchovies, which are important for the lucrative fish sauce industry.
Official figures from 2003 show a total marine catch of 2.65 million tonnes valued at US$1 604 million with the GOT contributing about 70 percent of this total. Landings are dominated by pelagic fish (25.5 percent) and trash fish (23.4 percent); the remainder comprised demersal fish (13.7 percent), squid and cuttlefish (5.2 percent), shrimp (11.7 percent), crab (1.6 percent) and miscellaneous species (9.4 percent).

Trawls accounted for about 58 percent of the 2003 fish catch, with 26 percent coming from purse seines and the remainder from gill nets, lift nets, falling nets, crab traps, squid traps and push nets.

Boats operating in the GOT can be divided into small-scale fishers and commercial fishers. Small-scale fishers are defined as those with boats (with or without engine) of less than 12 m overall length (LOA) and that conduct their fishing operations less than 5 km from the shoreline, usually in one-night operations.

The common gear used are gill nets (fish, shrimp, crab, etc.), lift nets, traps, falling nets, entangling nets, set nets, set bag nets and hooks-and-line. Catches are usually landed at the fisher’s home village and sold directly to consumers or to middlemen.

![Fig. 8 The composition of Thailand’s fishing fleet](image)

Commercial fisheries are defined as those with powered boats of more than 12 m LOA or more than 10 gross tonnes and include trawlers, purse seiners, push netters and short-necked clam dredgers. These boats employ several crew members and voyages can last several days. They are usually equipped with echo-sounders or sonar for purse seining. All commercial boats tend to use modern fishing gear and operate in offshore waters. Those operating outside Thai waters will have their own freezers on board. Catches are landed at large fishing ports and sold to fish agents. Trash fish catches may be landed at fishmeal plants directly.

In the 1960s, trawl fishing was introduced from Germany. As a consequence, fishery production from the commercial and small-scale sectors increased from less than 150 000 tonnes in 1953 to more than 2 500 000 tonnes in 2003.

Catches of anchovy have increased substantially from 1982 up to now, because of the introduction of light luring techniques. In 1995 the total catch of anchovy in Thailand was estimated by the Thai DOF

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8 From DOF published data 2005.
as 169,359 tonnes. The development of anchovy fisheries continues to expand rapidly in the GOT in order to satisfy the demand for diversified domestic and export products.9

Although these figures reflect dramatic and impressive increases overall, catch per unit effort (CPUE) has declined dramatically. This has been well documented through DOF research vessel surveys, which suggest that CPUE has fallen from a level of 172.94 kg/hr in 1966 to 23.36 kg/hr in 2005. Several factors may have contributed to this reduction in CPUE: the increasing numbers of fishing boats (including returning offshore Thai trawlers); the rapidly increasing human population and diversified domestic markets, which have developed processing techniques for turning low-priced demersal fish into acceptable human food; and the booming export markets for Thai seafood products.

Estimates of the numbers of vessels fishing in the GOT vary considerably. The DOF estimates boat numbers to be between 8,000 and 12,000 in the period 1990 to 1997 (see Fig. 9). However, this may be a gross underestimation as the data only take into consideration registered fishing boats. DOF does keep a record of licensed fishing gears for larger vessels, but does not include smaller gears and vessels. The upshot of this is that the DOF can only really guess at the total number of boats fishing in Thai waters.

Based on surveys and voluntary reporting, researchers estimate that there may be as many as 57,000 fishing boats operating in Thailand’s marine waters with about 30,000 vessels operating in the GOT.

With fuel prices being the main component of the operational costs of Thai fishing boats, some fishers have now stopped fishing or have reduced the number of fishing trips, resulting in increasing unemployment among fishers with a knock-on effect on related industries such as processing and ice plants.

To counter this trend the Ministry of Agriculture and Cooperatives took the controversial step of providing fuel subsidies to fishing boats. The decision to subsidize fuel in response to the declining viability of fishing has allowed many fishers to stay in the industry at a time when a natural attrition would otherwise have been taking place.

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9 Fresh and dried fish, fish sauce and budu (a Southern Thai food) made from anchovy are usually supplied for domestic consumption. Boiled-dried anchovy and anchovy fish sauce are exported in large quantities and fetch relatively high prices.
However, to keep the operational cost low, fishing boat operators increasingly are engaging foreign labourers from neighbouring countries such as Myanmar and Cambodia who often work illegally and have no social security protection.

Taking all these factors into account, it is now generally acknowledged that the economic viability of fishing in Thailand’s coastal and marine waters is in serious doubt and that there is a considerable overcapacity within the Thai fishing fleet operating there, even if the actual extent and nature of this overcapacity is unknown. New and innovative management approaches and more interactive management processes for Thailand’s fisheries are urgently needed.

4.2 Attempts at capacity reduction in the Gulf of Thailand (GOT)

In response to the well-documented decline of the resource base and decreased economic viability within the fishing industry of the GOT over the last ten years or so, the DOF has debated strategies for achieving fishing capacity reduction in the GOT and a number of national level workshops and consultations have concluded that a cutback in the number of fishing vessels was desirable in order to protect the livelihoods of fishery stakeholders and to conserve the GOT’s natural resources for use by future generations.

Eliminating push netters and trawlers is the strategy that the DOF considers is the most desirable, achievable and would have the biggest positive impact on the GOT fishery. Push netters and trawlers catch indiscriminately and are environmentally

Possible DOF strategies for achieving capacity reduction:
- registering all fishing vessels and gear;
- encouraging voluntary retirement from the GOT fishery;
- providing incentives to fishers to leave the GOT fishery;
- implementing boat and gear buy-back schemes;
- legislating against fishing gears that are inefficient;
- enforcing laws against illegal fishing practices and gears; and
- eliminating push netters and trawlers from the GOT fishery.
damaging. They are a frequent source of conflict between commercial and small-scale, artisanal fishers. DOF scientists have used economic modeling to highlight the potential benefits of a significant capacity reduction in the trawl and push net fisheries in the GOT. In addition, the economic implications for the fishers who would leave the fishery have also been modeled successfully. Scenarios tested included buy-back approaches and managing various capacity levels by boat and gear types.

However, the current DOF policy, although fully committed to decentralization and increased community participation, still appears to be productivity orientated and does not appear to provide much guidance for orchestrating capacity reduction in Thailand’s fisheries.10 Progress towards capacity reduction is further constrained by the sensitive political and socio-economic nature of the issue, as well as the absence of any legal precedent. The Minister of Agriculture and Cooperatives, wishing to act decisively but constrained by these limitations, recently issued a notification restricting the entry of new trawl and push net boats to the GOT fishery.

In addition to this measure, the DOF has chosen to attempt to reduce fishing pressure in the GOT fishery through proclaiming new closed fishing areas and expanding some existing conservation zones from 3 km to 3 nm.11 At the same time the DOF is attempting to increase productivity through the installation of artificial reefs and the release of juvenile fish and other aquatic animals into the fishery. Attempts to encourage trawlers to fish farther offshore and in international waters have met with limited success.

The DOF has piloted a number of projects, which have explored capacity reduction issues. One of these was the Fishery Resource Rehabilitation Project, through which more than 19 million Baht was provided to about 1 300 push net fishers in Ranong Province on the Andaman Coast, who agreed to give up push netting and switch to less-destructive fishing methods and/or alternative jobs. Many of the fishers used this money to refit their boats with less environmentally-damaging fishing gears, whereas others used the money to establish small-scale businesses, including aquaculture enterprises. Fishers who left the push net fishery had to sign an agreement with the DOF in the presence of their community leaders and peers, not to return to this type of fishing.

Buoyed by the relative successes of this project, the DOF looked to increase its fishing capacity reduction efforts through this FAO-led initiative. This would allow the DOF to acquire additional information on the socio-economic dynamics of fishing communities in the GOT and the scope for fishers to diversify into other activities and types of employment. At the same time this initiative was also seen as an opportunity to gauge the willingness of push net and trawl fishers to leave the fishery.

4.3 Generating quality information: a background study and opinion poll

To generate reliable and up-to-date information on the trawl and push net fisheries of the GOT and the situation of the stakeholders involved, a background study and surveys of fishing boat crews, vessel owners, fish processors, push netters and trawl operators were organized by the DOF and carried out by consultants in four zones of the GOT (Eastern, Inner, Upper South and Lower) thus allowing for some comparisons to be made.

4.3.1 Stakeholders’ attitudes towards leaving the industry

The first survey was carried out by the ABAC Poll Research Center at Assumption University. The researchers interviewed three sets of stakeholders: fishing boat crews, vessel owners and fish processors.

10 The National Fishery Development Policy (2002-2006) states that fishery production levels should be not less than 1.7 million tonnes per year and the uneconomic exploitation of fisheries resources should be less than 100 000 tonnes per year.
11 Nautical miles (1 nm = 1.852 km)
The ABAC survey generated some interesting results, which are briefly summarized below. It concluded that overall about half of the total number of respondents might be willing to cease push netting and trawling if the conditions were right. The majority of those who said that they would not be willing to give up fishing quoted the lack of alternative skills and the lack of finance as the main deterrents. Other results are presented below.

- Only 14 percent of fishing crew members interviewed wanted to remain in their current occupations. Crew members were primarily motivated by income levels and most would be willing to switch occupations if this meant an increase in regular incomes. The stability of the job, locality, social security and personal safety were also important considerations in any career change. However, almost half of all crew members had yet to identify any realistic alternative career opportunities.

- More than 76 percent of vessel owners did not wish to switch careers. High levels of loan-based investment in boats and gears had tied many boat owners to the sector. Those that were considering leaving cited rising production costs (primarily fuel) and the comparatively low financial returns as the motivating factors. However, only a minority of vessel owners mentioned the decline of fish as a reason for wishing to change to another occupation. The low capital returns from fishing were being blamed instead on the low market price of fish and were not yet perceived as being directly related to the resource condition.

- Vessel owners were generally pessimistic about the future of the GOT fishery with over half of them anticipating a continuing downward trend in productivity and economic viability. Even with subsidized support, Thai fishers interviewed saw little future for the next generation in the GOT fishery and most hoped that investment in education would allow their children to take up alternative and more lucrative careers.

- Many (78 percent) fish processors surveyed were willing to consider alternative operations. This group was also affected by rising fuel prices and other production costs as well as the growing scarcity of raw material. It is possible that their willingness to consider changing occupation may be a result of the relative ease with which they could adapt their skills and facilities to other purposes or products.

4.3.2 The trawler and push netter survey

The second survey, carried out by the Department of Agricultural and Resource Economics (DARE), Faculty of Economics at Kasetsart University, generated useful information on three types of trawl fisheries as well as the push net fisheries in the same four zones of the GOT.

Data collected on catch composition confirmed many earlier studies and showed a dramatic trend of “fishing down the food chain” in the GOT (see Fig. 10) and highlights the growing importance of trash fish.

The DARE survey was consistent with the ABAC findings with regards to fishers’ interest in leaving the sector. Figure 11 illustrates this in terms of fishing boat and gear type.

The results suggest that the willingness to leave the GOT fishery is not homogenous across gear types. No large-scale pair trawl fisher surveyed expressed a desire to leave the fishery. Medium-scale pair trawlers and medium-scale and large-scale beam trawlers were also reluctant to leave. However, large otter board trawl fishers and small pair trawlers were unanimous in wishing to leave.

The willingness to leave appears therefore to be related to the financial returns from these fisheries. No operator involved in the most lucrative fishing operation, i.e. large (> 25 m) pair trawling were interested in leaving the fishery. At the other end of the spectrum, 100 percent of small (< 14 m) pair trawlers expressed a wish to leave and the survey data suggest that this scale of operation is no longer economically viable.
The study also highlighted the very large extent that the trawl and push net fisheries around the GOT depend on foreign workers. Although there are huge variations within the sector, on average roughly two-thirds of the workforce is made up of foreign crew members, mostly from Myanmar and Cambodia. Across the sector and the various boat types investigated, there is a general agreement that hiring non-Thai workers has become a necessity because of the difficulty in finding Thais willing to work in

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12 From KU survey data 2006.
13 From KU survey data, 2006.
the industry. Push netters had the highest employment rate of Thai workers, with small push netters tending not to employ any foreign workers. Large pair-trawlers on the other hand had a very high number of foreign workers.

Together, these two studies provide considerable insight into GOT fishing livelihoods and paved the way for informed discussion on capacity reduction and related issues with DOF policy-makers and stakeholders. The findings also allowed boat classes and gear types to be prioritized in terms of the need for their removal from the GOT fishery. As the regeneration and recovery of fisheries resources is a goal of Thai capacity reduction efforts, it can be argued that fishing boats with the highest negative impact on natural resources should be decommissioned first. Another consideration for selection is the profitability of fishing operations, with uneconomic boats and gears also being earmarked for decommissioning first.

The DOF concluded that push netters, particularly small ones, meet both these criteria and as a result should be targeted for capacity reduction first. The studies confirmed that they tend to operate on very small margins with low rates of return. From an environmental perspective they are damaging to marine benthos and the majority of their catch is composed of trash fish, including immature juveniles of economically important species.

### 4.4 How the information was used: engaging the stakeholders

Even the best information is useless if the concerned stakeholders do not use it. Based on its participatory principles of stakeholder involvement, the DOF initiated a process of involving stakeholders in dialogues aimed at exchanging views, observations and information and engaging equitably in resolutions and joint actions, as depicted in Fig. 12 below.

![Fig. 12 Flow chart of the DOF consultation and action plan process](image)

Having considered the information from the background studies, the DOF arranged a series of stakeholder consultation meetings to present the survey findings, discuss their implications and seek recommendations that could be used to bring about a reduction of fishing capacity in the GOT.
Typically, these meetings involved about 65 persons from the public and private fisheries sector, fisheries researchers, provincial fisheries officials as well as Kasetsart University and ABAC staff. During these meetings the current status of the coastal and marine fisheries in the GOT was presented and the current fisheries laws and regulations for the trawl and push net fishers outlined. These presentations were followed by the introduction of the results of the ABAC opinion poll and the Kasetsart University survey. The participants were then organized into two groups (trawl and push net fishers) for discussion of the results and to propose recommendations for action.

The recommendations covered a range of issues— from the need for an improved boat and gear registration system to compensation options, such as buy-back schemes and the facilitation of alternative livelihood opportunities.

A summary of the main recommendations made by stakeholders, in order of consensus appear in Table 4 below. Those that are most relevant to capacity reduction appear in bold.

<table>
<thead>
<tr>
<th>Recommendations made by stakeholders</th>
<th>Number of SCMs where issue raised by trawl fishers</th>
<th>Number of SCMs where issue raised by push net fishers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Provide alternative skills training &amp; employment</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2. Control boat numbers</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>3. Control fishing gears</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>4. Control illegal fishing</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>5. Establish more artificial reefs</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>6. Establish a buy-back programme</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>7. Enforce “no fishing zones” and seasons</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>8. Raise awareness of fisheries issues</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>9. Improve registration system</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>10. Involve communities in fishery management</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>11. Provide financial support</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>12. Establish a moratorium on boat building</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>13. Promote offshore fishing</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>14. Subsidize fuel</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>15. Introduce a catch quota system</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>16. Promote aquaculture</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

The important issue of assisting stakeholders in developing alternative skills and career opportunities was raised by trawler fishers and push netters alike. Any strategy for reducing fishing capacity and the number of boats must consider the potential impacts on local labour markets. The question of alternative employment and livelihoods, or for larger vessel owners, the question of alternative business opportunities, is central to capacity reduction discussions and strategies. The lack of obvious alternatives can become the “killer argument” sometimes used by industry representatives, fishers and policy-makers to derail serious fishing capacity reduction efforts.

Following the stakeholder consultation meetings, the baseline survey and consultation findings and recommendations were presented to senior fisheries sector representatives at a high-level senior consultation meeting held in Bangkok in August 2006. The one-day meeting involved about 100 participants, including senior officials from central DOF and the coastal provinces, university professors, fisheries associations and business managers and fisher community leaders.
This meeting concluded by outlining a number of recommendations to sustain the GOT fishery (see box below).

It can be argued that, as with the stakeholder consultations, the recommendations covered an overly broad range of issues and topics and thereby deflect attention away from the main issue up for discussion, namely capacity reduction.

The recommendations from the stakeholder discussions and the senior consultations were then used by the DOF to draft a plan of action. This draft plan summarized the main issues raised at the stakeholder and senior consultations and recognized that any effort to reduce fishing capacity in the GOT had to be an integrated part of a wider strategy for responsible fisheries management.

A common theme in many of the issues listed in the table above is that of increasing community participation in various aspects of fishery management.

Thus, the draft plan also addressed issues like institutional arrangements, fisheries legal framework, management and resource enhancement approaches.

Although this is logical, it could be argued that these other recommendations for action again tended to divert attention away from the critical capacity reduction issue, which as a result then becomes just another aspect of an integrated plan of action rather than its focus.

4.5 Changes in policy and planning

The findings from the senior consultation meeting were submitted to the Director-General and further endorsed by the Permanent Secretary of the Ministry of Agriculture and Cooperatives. After approval it was agreed that the DOF would consider incorporating these findings, including those on capacity reduction, into the drafting of their master plan for marine capture fisheries. While this process was underway, the DOF took a decisive step towards eventual capacity reduction in push net and trawl fishers through using its provincial offices to begin registering fishers who were interested in leaving the fishery.

In May 2007, the DOF initiated a pilot project to register push netters and trawler operators who were interested in leaving the GOT fishery. Local advertising campaigns were organized and registration windows in 14 provinces were scheduled. The DOF stressed that this registration would be voluntary and non-binding. This first attempt at such an exercise by the DOF resulted in 320 fishing boat crew members and 388 boat owners registering an interest in leaving the fishery.

The level of interest in this scheme varied widely from province to province, with Songkhla province reporting the highest registration figures (180 fishers and 190 boat owners) and Rayong, Samut Sakhon, Prachuab Khiri Khan, Surat Thani and Pattani fewer than five fishers and five boat owners each. It is
The five DOF master plan strategies

1. the development of effective marine fishery management and participation;
2. the reformation of the structure of fishery agencies;
3. the development of responsible and sustainable marine fisheries;
4. the rehabilitation of the ecosystem and improvement of fishing grounds to conserve biodiversity and marine environmental quality; and
5. the promotion and development of overseas, (offshore) fisheries.

Perhaps unfair to say that these results were disappointing. It should be stressed that the voluntary registration was in no way binding and was only to assess the level of interest in leaving the fishery. Some fishers may have suspected that the registration process was a step towards being forced out of the fishery by the government. Registration levels may well increase if the process continues and once stakeholders understand fully the objectives and intentions of the DOF in this regard.

Despite the modest progress made by the DOF, this exercise should be seen as a useful learning experience and as a first step in the actual implementation of a capacity reduction process for the GOT fishery.

In late 2007, a draft DOF Master Plan for Thai Marine Capture Fisheries Management was developed and is scheduled to be implemented over two phases, 2007 to 2011 and 2012 to 2016. Within these five strategies are references to capacity reduction-related issues such as improved vessel registration and the development of alternative employment opportunities for fisheries stakeholders.

Under strategy one, there is reference to a five-year plan to develop and strengthen registration systems, (vessels, gears and fisheries), and it is likely that the decision has been made by senior DOF policy-makers that serious efforts at capacity reduction in the GOT, as well as elsewhere, cannot be made until registration systems are improved.

However, there is neither explicit reference to capacity reduction as an objective nor any commitment to implement capacity reduction tools such as buy-back programmes. It appears that, perhaps for political reasons, the issue of capacity reduction remains too sensitive to meet head on by the current administration and can only be approached through stealth and addressing associated issues. However, as a result of the process embarked upon so far, there is now a core of senior DOF officials who are championing the capacity reduction cause and have benefited greatly from the experiences gained over the past three years.

4.6 Key lessons learned

The road to a policy that accepts the reality of fishing overcapacity and commits to actions that will wean people away from an unsustainable GOT fishery and establish a long-term support mechanism that encourages alternative lifestyles will be long and arduous. Through the use of the resources made available through FAO, the DOF has been able to take some small but important steps towards this eventual objective.

The DOF has been successful in highlighting the case for capacity reduction in the GOT and communicating its findings to a wider audience. It is understood that in the past it had been difficult to discuss this issue publicly. The DOF can take considerable credit for bringing this issue out of the shadows and into the public domain.

Despite the successes in generating quality information for policy-makers and planners, realistically, real changes in government policy will only come about if the political will exists. Experience has shown how difficult it is for fisheries departments to influence policy change in the absence of political commitment to the issue being addressed. An issue such as capacity reduction in the fishery is not an easy issue for politicians to advocate, especially if no immediate crisis or gain is anticipated. This perhaps
explains why the draft master plan does not make overt reference to the capacity reduction issue, instead focusing on associated issues such as the vessel registration problem and the promotion of alternative lifestyles.

The regular dialogue with stakeholders, implementers, planners and policy-makers in the Thai fisheries sector appears to have created the conditions whereby a previously taboo subject, i.e. capacity reduction could be more openly discussed. One of the strengths of the DOF’s work was the extremely broad stakeholder representation throughout the consultative process. Through facilitating these community discussions, the DOF staff involved may well have helped change the way many people (both fishers and officials) perceive working together to resolve fisheries issues. Through this work, the DOF has been very successful in facilitating information exchange between government agencies and Thai coastal communities.

The poor economic position and hardship facing many small-scale fishers in Thailand has been highlighted through this work and a strong contribution made to the policy debate on what must be done to protect these livelihoods if the trends continue. Like many Asian countries, Thailand has to face up to the reality that fisher communities stand to get poorer over the coming decades as their lifestyles and skills base excludes many of them from the rapid economic progress that is occurring elsewhere.

In the past, socio-economic information has not always been accorded the same weight or importance by fisheries departments as biometric data on fish catches, CPUE etc. However, through its proactive use of socio-economic information the DOF has demonstrated the importance of socio-economic information and how it can be used in policy and planning processes.

The experiences gained by the DOF throughout this process have highlighted the difficulties facing fishers in finding practical employment and livelihood alternatives. Many fishers do not own land or own very small parcels of land and so cannot easily change to agriculture or livestock production-orientated livelihoods. The majority of fishers in the surveys carried out, listed fishing as their sole occupation and so may lack the skills to diversify or change their livelihoods. Fisher communities might not have such good access to education as other communities and therefore may not be able to acquire the knowledge and skills associated with working in other sectors easily. In addition, the mindset of “fishing today and not worrying about tomorrow” may also affect their decision-making when it comes to involvement in other activities that require more careful and long-term planning. Finally, the distance of many fishing communities from major cities and communications means that industry and diversified employment opportunities do not exist in their localities. All these issues combine to make the transition of fishers to other livelihood occupations extremely difficult and no doubt expensive for governments to facilitate.

The DOF remains realistic about the limited opportunities that most fishers have to change from a capture fishery-based livelihood to an aquaculture-based one. Where fishers have made this transition, the development of intensive aquaculture, instead of substituting for coastal fisheries, can result in increased fishing pressure through increasing the demand for wild caught seed and trash fish. Less intensive aquaculture systems such as mollusk culture, which has been taken up by many fishers under Thailand’s Seafood Bank Policy, are generally less labour intensive and have a longer turnover, resulting in fishers tending to add aquaculture to their livelihood portfolios and continue fishing much as before. Policies to move fishers from capture to culture are therefore usually simplistic at best.

The fishers’ needs for compensation to leave the fishery appear mainly to be centered on financial support, either through the establishment of an investment fund which they could have access to, or a buy-back scheme which would enable them to recover capital previously invested. Without either of these instruments, it is unlikely that fishers will leave in any great numbers, especially if they think such compensation schemes may come on line in the near future.
There is also the risk that despite efforts to encourage fishers to diversify their livelihoods and leave the fishery, the open access situation in the coastal zone fishery and the limited amount of skills required to start fishing, any capacity reduction could be offset by new entrants and old fishing equipment (re)joining the fishery. In serious capacity reduction programmes, efforts will have to be made to ensure that others (e.g. boats fishing in international waters) do not enter the GOT fishery to replace those that have left.
Improving information flows in the coastal fisheries sector: Viet Nam
5 Viet Nam’s marine capture fisheries

In recent years, Viet Nam has become one of the largest exporters of aquatic products in the world. The Ministry of Agriculture and Rural Development (MARD) estimates that in 2004, fisheries production surpassed three million tonnes with more than half this total coming from marine capture fisheries (1 724 200 tonnes). In 2007, provisional figures suggest that fisheries production now may have exceeded four million tonnes, generating US$3.75 million in export earnings and accounting for 6 percent of national GDP. Employment in the sector has diversified away from a main focus on coastal fisheries to include offshore fishing, aquaculture, processing and other sector service activities. It is estimated that the fisheries sector employs more than four million workers.

The rapid growth in Viet Nam’s fisheries production has largely been because of increases from aquaculture, which is currently growing in excess of 15 percent per annum. Fig. 13 illustrates the trend of exponential aquaculture growth amidst a leveling of production from the capture fisheries, suggesting that this latter may have peaked or may now be in an overexploited state.

The fact that the rapid growth of aquaculture may be increasing the demand for trash fish resources and wild aquatic seed will prevent a long-term continuation of this trend and it is naïve to expect aquaculture to continue to bail out or compensate for failing capture fisheries.

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14 Source: General Statistics Office, Viet Nam.
Offshore and coastal fishing capacity has continued to increase rapidly in recent years. For example, it is estimated that between 1991 and 2003, the number of fishing boats increased by nearly 90 percent, from 43,940 to 83,122, (i.e. > 3,500 boats/year, an estimated 2,500 of which entered coastal fisheries).

These capacity increases have managed to maintain production levels from the marine capture fisheries but CPUE levels have fallen sharply, as have the quality and value of the catches landed. There are clear indicators that an increasing percentage of the stocks caught from capture fisheries are from species that feed low on the food chain or are juveniles of more commercially important species. As earnings per fishing trip have declined, illegal, unregulated and unreported (IUU) fishing activities have become more widespread, requiring urgent action by the government to prevent a possible catastrophic collapse of Viet Nam’s coastal and marine fisheries.

The degradation of the coastal environment as a result of Viet Nam’s rapid industrialization and population growth is placing additional and unprecedented pressure on coastal capture fisheries resources. Coastal fisheries are also coming under increasing pressure from other economic activities that are carried out in the same or nearby geographical areas, or are interacting in complex ways with these activities.

Officials charged with the formulation and implementation of policies to protect the environment and small-scale fisheries in Viet Nam face a number of difficulties and shortcomings. On the one hand, policy-makers, planners and managers have only a limited understanding of fisher livelihoods and activities and so may produce impractical or irrelevant polices. On the other hand, it is not easy for fishers, who may only have a low standard of education, to have access to the policy-makers or to understand or conform to the policies that are produced. The lack of opportunities for stakeholder dialogue is thought to contribute to the current unsustainable exploitation and utilization of fisheries resources.

Recent government policies for coastal fisheries have focused on attempting to reduce fishing pressure on coastal resources through re-organizing coastal fishing operations, improving fisher community living standards and ensuring the sustainability of fisheries resources. MARD is promoting various interventions to support these broad objectives. These include:

- the identification and protection of possibly endangered aquatic species by prohibiting fishing activities that may harm these species or generally have negative impacts on fisheries resources and the environment;
- the implementation of programmes to protect critical habitats, such as coral reef, seagrass, mangroves and other areas that may serve as nursery and breeding areas and the migratory pathways of important species;
- the implementation of resource enhancement programmes through the rearing and release of juveniles of threatened species;
- the provision of low interest loans to those fishers with high levels of professional skills to enable them to shift from fishing in coastal waters to fishing in deep-sea areas or switching to marine aquaculture; and
- the capacity building and training of fishers for alternative employment and business opportunities.

5.1 The fishery sector in Quang Ninh province

Quang Ninh province is situated in northeast Viet Nam and shares a border with People’s Republic of China. It is one of the largest provinces in the country with a total land area of about 6,110 km². Its topography is diversified, with three different areas including mountainous areas (approximately 3,000 km²), the central area and coastal delta (approximately 2,500 km²) and many small islands (620 km²).
The province is located on the Gulf of Tonkin and has a network of more than 2,000 islands being located along the 250 km coastline. The seawaters surrounding the islands form numerous waterways and canals and include the famous Ha Long Bay, internationally recognized as a World Natural Heritage Site. Traditionally, these areas have been used by fishing boats as natural refuges against gales and storms. They are also important breeding and nursery areas for many marine species.

At the end of 2005, the population of Quang Ninh province was 1,078,900 with a relatively low growth rate of 1.66 percent/year. There is a high degree of urbanization with nearly half of the population living in cities and towns. The major industrial sectors of Quang Ninh province are coal, electricity and transportation (including both roads and waterways). The province contributes 90 percent of the country's total coal production and has investigated coal reserves of about 3.6 billion tonnes. The economic profile of Quang Ninh has changed in recent years as a result of industrialization and services development, reducing the relative contributions from the agriculture and fisheries sectors to the province's economy.

As a result mainly of the extraordinary Ha Long Bay, tourism has become a major economic sector of the province and now accounts for more than 40 percent of GDP. Agricultural production is relatively small but has an extremely important role in rural food security with the area under cultivation being about 76,000 ha.

Fisheries resource surveys have identified 173 species belonging to 106 genera and 73 families. Predominant species include threadfin porgy (Evynnis cardinalis), yellowstripe scad (Selaroides leptolepis), mitre squid (Loligo chinensis), stripedfin goatfish (Upeneus bensasi) and pink shrimp (Metapenaeopsis). The total marine fisheries stock of the province is estimated to be about 366,000 tonnes and includes pelagic and demersal fish, cephalopods, shellfish and crustaceans.
Fisheries production in Quang Ninh province soared from 9,550 tonnes in 1991 to 52,700 tonnes in 2005, of which 36,000 tonnes came from capture fisheries and 16,700 tonnes from aquaculture. Aquatic products had an export value of US$42.6 million in 2003 and now accounts for 17 percent of the province’s exports. Seafood from Quang Ninh is exported to China, Hong Kong SAR,15 Taiwan POC,16 and Japan and improved processing technology and hygiene standards are allowing aquatic products to penetrate into new markets, including the European Union and North America. Although less than 10 percent of the province’s population is engaged in fishing activities, the sector has seen a doubling of people engaged during the period 1991 to 2004 and a threefold increase in human resources engaged in aquaculture.

In 2005, the provincial fishing fleet totaled 7,170 units, including 5,518 motorized boats with a total capacity of 122,000 HP, with most of them operating inshore. In addition to growing local fishing capacity, the coastal waters of Quang Ninh are also fished by Chinese boats and fishers from other Vietnamese provinces, creating a huge demand on the area’s natural resources and complicating fisheries management considerably.

Aquaculture production in Quang Ninh has in recent years expanded significantly; the many sheltered bays being ideal sites for the cage culture of high-value fish and molluscs. Shrimp farming is well established and there is a productive freshwater aquaculture sector in the province. Fig. 15 shows the trends in aquaculture production between 2001 and 2005. Growth in the sector now appears to be mainly through freshwater species and marine fish (presumably cage culture); mollusc culture appears to have peaked whereas shrimp farming production may be in decline.

The growing imbalance between fishing capacity and coastal fisheries resources is of great concern to the government. As with the situation elsewhere in Viet Nam, there are clear signs that the coastal fisheries are being overexploited and fishing down the food chain is becoming prevalent. This situation is being exacerbated by the growth of cage culture of high-value fish species. This trend in fishing down the food chain can be seen clearly in the case of jellyfish, which until recently was considered a nuisance species with no economic value and was discarded, but now has become a valuable and important commodity for export.

15 Hong Kong Special Administrative Region of China.
16 Taiwan Province of China.
Quang Ninh province faces a growing number of environmental concerns that threaten the integrity and viability of the coastal fisheries. There are clear incompatibilities between some of the economic activities in the province. For example, tourism revenues are affected by pollution incidents (including the visual pollution by cage farms), whereas fisheries are beginning to be affected adversely by pollution from industry and urban communities. There is an urgent need to zone and harmonize conflicting economic activities in the province.

Faced with a declining resource base and overcapacity in the coastal fisheries, the provincial government is encouraging coastal fishers to diversify into other activities and areas, such as offshore fishing, aquaculture, services and tourism. To date, the results of these efforts have been mixed as institutional support has been limited and most fishers lack the necessary skills and finance to make significant career changes. There is also a general unwillingness among fishers to leave the sector as, despite its problems, fishing tends to provide a higher income than other agricultural and service-based activities.

5.2 Generating and communicating information for fisheries management

The Government of Viet Nam saw this FAO initiative as an opportunity to explore modalities for adopting participatory approaches in information exchange processes at a range of administrative levels: from the national and provincial to district and community levels. To gain the most from this opportunity it was decided that a single province, Quang Ninh, would be the focus of activities, which concentrated on:

- gathering and collating information on the status of marine and coastal fisheries resources in Quang Ninh;
- achieving a better understanding of fishers’ livelihoods and activities;
- strengthening the capacity of local officials to interact effectively with fisheries stakeholders in information exchange processes;
- identifying conflicts between resource users and propose solutions to addressing these conflicts;
- encouraging fisher communities to participate in discussions leading to policy development and resource management planning; and
- increasing fishers’ awareness and understanding of current government policies and plans.

5.2.1 A basis for dialogue: background studies on key issues affecting the sector

The first step in this process was to organize a series of background studies that would inform the Ministry of Agriculture and Rural Development (MARD) and its local level partners of the current status of coastal fisheries and related issues. Between August 2005 and May 2006, four studies were carried out by staff of the Fisheries Informatics Centre (FICen) and Quang Ninh Department of Fisheries.
Together, they provide a comprehensive profile of the fisheries sector and its stakeholders and highlight the core issues and problems. The four background studies carried out were:

(1) **The current status of marine resources and fishing activities in Quang Ninh province**

This study, completed in August 2005, provided a summary of the current status of marine resources and fishing activities in Quang Ninh province. It outlined the current exploitation level of the major fisheries resources and provided information crucial for the formulation of management plans for the sustainable development of coastal fisheries.

(2) **Conflicts among fishing groups and other users in the coastal areas of Quang Ninh province**

This study examined the sources of and reasons for conflicts between competing fishing groups, as well as conflicts between fisheries stakeholders and other resource users. The study concludes that the increasing number of people competing for dwindling resources is the driving force behind most conflicts. The issue of offshore boats returning to exploit coastal waters (because of their inability to compete with better-equipped foreign fishing vessels) was identified as a major flashpoint. A number of other fundamental conflicts included:

- the expanding demand and fishing effort versus diminishing resources;
- the negative effects of fishing operations on other economic activities; and
- competition between local fishers and those from other provinces and other countries.

(3) **Socio-economic issues including health and HIV/AIDS in fishing communities**

The third study looked at fishing communities in a wider socio-economic context and included health issues, such as HIV/AIDS. Also covered was the important issue of employment and other livelihood opportunities for fishers, both within and outside the fisheries sector. This study thereby provided insight into the practicalities of policies to encourage coastal fisheries labour to move to work in other sectors, particularly offshore fishing and aquaculture. The urgent need to find and promote alternative employment opportunities for small-scale coastal fishers was confirmed by these studies. The study concluded that HIV/AIDS was largely an urban problem and most fishing communities in Quang Ninh were not at particularly high risk.

(4) **Socio-economic indicators to monitor and evaluate sustainable fisheries development**

The fourth study attempted to identify key socio-economic indicators, which could be used to add to the evaluation of the performance of the fisheries sector in Quang Ninh. These indicators were seen as a potential alternative to the conventional production-based indicators commonly used by Viet Nam’s fisheries researchers and managers. The study identified a wide range of alternative indicators including economic, social, institutional and ecological measures that could be used as benchmarks.

5.3 **Communicating information and knowledge: the consultative process**

Operating concurrently with the background studies, FICen implemented a broad stakeholder consultative process reaching from national level to community level. The process began with the National Inception Workshop, which aimed to brief senior government staff on participatory approaches to stakeholder information exchange. This was then followed by consultations at provincial level and district administrative level before a series of fisheries stakeholder consultations began in October 2005.

The process continued by means of feeding back commune and village level issues and perspectives, firstly to provincial level staff and then to senior, national level staff at a final national workshop. In this way a demonstration of the advantages and benefits that result from involving wider stakeholder representation was made to senior planners and policy-makers. Figure 16 illustrates the complete consultative process.
Fig. 16 The consultation process

**KEY**

1. Hanoi, Apr 05
2. Ha Long City, Jun 05
3. Van Don Dist., Aug 05
4. Van Don Dist., Sep 05
5. Minh Chau com., Oct 05
6. Eight sites, Van Don, Oct 05
7. Cai Rong, Minh Chau, Ha Long com., Nov 05
8. Cai Rong, Minh Chau, Ha Long, Dong Xa, Minh Chau, Thang Loi, Ngoc Vung com., Nov 05
9. Ha Long, Dong Xa, Minh Chau, Thang Loi, Ngoc Vung com., Mar 06
10. Ha Long City, May 06
11. Hanoi, Jun 06
5.4 Top down and bottom up: from national level consultations to local level dialogue and back

The cycle of activities was initiated through a National Inception Workshop, which gathered together policy-makers and planners from the fisheries sector and other related fields.

Conclusions of the first province-level consultation

- There is an urgent need to boost fisheries exports but also a need to safeguard resources for use by future generations.
- Fisher knowledge and awareness levels must be increased.
- Fishery managers must have a better understanding of fisher living conditions.
- Environmental issues must be taken into consideration more in policy and planning development.
- Improved coordination between different economic sectors is essential.
- The participation of the Women’s Union and the Youth Union should be encouraged for fisheries management purposes.
- Experiences and insights gained through this work must be communicated to other provinces.

During the deliberations it was agreed that:

- provincial fishing capacity and effort were beyond sustainable levels;
- poor information exchange within the fisheries sector was contributing to the problem;
- the methods used for fisheries information collection and dissemination had to change and should take advantage of modern equipment and communication methods; and
- commune organizations and fisheries associations have a major role to play in fisheries management information processes.

The workshop increased awareness of the importance of information exchange in decision-making processes.

During the first provincial workshop much of the discussion focused on the degradation of coastal resources in the province and the urgent need for a coordinated cross-sectoral approach to resolving the problem. The consultation also aimed to enhance participants’ knowledge of government policies on stakeholder job transfers and increasing the participation of local communities in the formulation of fisheries policies.

5.4.1 District-level consultations

District-level consultations enabled discussions about the opportunities for increasing the participation of local communities and the Women’s Union and Youth Union in local-level policy and planning processes.

The discussions focused on three issues affecting fisheries in Van Don District:

- the process of job restructuring and implementing fisheries policies in Van Don District;
- the exploitation of some threatened species and endangered species in Quang Ninh; and
- the role of farmer associations in promoting fisheries-related policies and gathering feedback from communities.
The issues of a declining natural resource base and the increasing level of fishing capacity and effort were raised by many of the presenters and highlighted the need for quality information on the sector to facilitate more informed policy and planning processes. Finding a solution to these problems remained a great challenge.

During the district-level discussions, the problems related to the policy of transferring fishing effort from coastal fisheries to offshore fisheries were brought up:

- The policy focused on boat building and gears rather than on human resource development. As a consequence, results were well below expectations.
- There was a lack of support from local authorities for Women’s Union project initiatives, despite the important role that women play in the fisheries sector.
- Information on government regulations and policies took a long time to reach communities and was often incomplete, resulting in indifferent responses from fishers and other stakeholders.
- Much of the fisheries produce from the district was being sold cheaply to middlemen. Fishers needed assistance to improve the effectiveness of their trading and marketing activities.
- In order to maintain the development of coastal resources, the number of small boat operators needs to be reduced and, where possible, the fishers encouraged to switch to aquaculture. However, the potential negative impacts of aquaculture on the environment, e.g. pollution and the increased demand for trash fish, must also be carefully considered.
- The need for technical training for officials on information gathering and dissemination approaches and methods was recognized during the consultation and a short training course was organized that introduced officials to participatory techniques and allowed them the opportunity to engage in meaningful dialogue with fishers and other sector stakeholders.

### 5.4.2 Commune and household consultations

Commune level consultations were co-organized by the People’s Committee of Minh Chau commune, Van Don District, Quang Ninh province in October 2005. These confirmed the increasing degradation of coastal aquatic resources and identified various reasons for this decline and reiterated the need for policies that aim at restructuring the occupational structure in coastal communes.

The consultations provided an opportunity to fishers to express what they thought was required to make the transfer from coastal fisheries to offshore fisheries: bigger boats, more modern equipment and more experienced and skilled labour and low interest loans. Another problem highlighted by commune members was the lack of onsite logistics, such as port facilities. Participants agreed that increasing investment in infrastructure would likely improve the performance of offshore fishers.

"Initially the offshore fishing performance was quite good. But in recent years, due to the massive development of the light luring lift net fleet, catches have declined considerably. Over this time, the costs of inputs such as fuel have doubled, yet product prices have not increased at the same rate and fishers often are under constant pressure to lower their product prices."  
Representative of Minh Hai cooperative

"The catch has declined progressively in recent years. Although the fishing grounds in the Gulf of Tonkin have very abundant and diversified aquatic resources, the competition among fishers has become more severe due to excessive fishing effort. In particular, fishers from other provinces and from China also fish in these fishing grounds and Chinese fishers have more experience in offshore fishing than local people, their boats usually have high capacity and are equipped with modern facilities, so they catch more."  
Do Manh Xung,  
Fishing boat owner, Minh Chau
For households unable to shift to offshore fishing, a better alternative could be aquaculture. To help them make this transition, it was suggested that the state provide technical and financial support as well as taking specific measures to help them to overcome the interim period before businesses see a return. The household division of labour, with women looking after aquaculture farms while men went (offshore) fishing, was seen to be advantageous and suggests that a shift to aquaculture for some fishing families may not actually mean a decrease in fishing effort, even at the family level. These points were reinforced by interviews and discussions with individual fishing households that sought to improve the communication between government officials and fisher communities in Van Don District.

During these household visits, discussions were held with family members on a range of socio-economic issues by means of an open questionnaire format. Basic information on the demographic characteristics and the socio-economic conditions of the fishing communities in the selected communes was gathered. Particularly useful was the information collected on income, investment, fisher attitudes towards authorities at different levels and their awareness and interactions with the environment and its resources.

Whereas most fishers agree that restructuring is necessary to address the worsening status of coastal fisheries, most do not appear willing or able to leave the sector. Lack of expertise, comparatively low educational achievements and the lack of finance, including access to credit, were listed as the main reasons for this hesitation. Discussions with boat owners who had tried offshore fishing but had now returned to fishing inshore highlighted the limitations of policies that seek to encourage greater participation by fishing boats in the open seas fisheries. These examples illustrate the value of consultations with stakeholders in providing valuable feedback on national initiatives for restructuring the coastal fisheries sector.

It was suggested that under the existing Fisheries Law, MPAs should be established to protect aquatic resources. However, before MPAs can be established, good organizational and management models must be put in place to guarantee that local people’s livelihoods are not adversely affected. It was
recommended that MPAs be developed in a way that they can serve the goal of resource protection and provide new income generation opportunities, e.g. ecotourism.

Fishers interviewed during these local consultations confirmed the increase in the number of conflicts between local fishers and non-resident fishers. Conflicts are particularly severe between Vietnamese and Chinese fishers in the Common Fishing Zone. Cases of the theft of fishing nets and other equipment were common. It was agreed that the government needed to raise people’s awareness of the policies and regulations by using different information distribution channels. It should also encourage the participation of socio-political organizations such as the Farmers Associations, Women’s Union, Youth Union and fisher community groups in training and disseminating information/knowledge to others.

5.5 Feeding local knowledge into policy and planning processes

A provincial consultation and a final national workshop were held to present an opportunity to assess the field consultation and data collection exercises and bring the findings from local-level consultations and field exercises to the attention of more senior government officials. It was also an opportunity to explore ways in which this type of information could be used in local policy and planning processes. Participants of these two workshops appreciated the chosen communicative approach to improve and expand knowledge of the fisheries sector as it improved the relationship between government officials and fishers. The dialogue process facilitated the recognition of the importance of qualitative information to supplement conventional fisheries catch and production statistics and that the dialogue process provides a good tool to generate such information.

These two workshops also helped senior officials to get a clearer understanding of the limitations of the fisheries restructuring policies that occur at the local level. For example aquaculture cannot realistically be a pragmatic solution to coastal fisheries management, until services such as formulated feeds and hatchery-produced seed become available. Without these, aquaculture development can result in an increase of pressure on coastal resources. The promotion of the culture of lower-value species or species that feed lower on the food chain was recommended.

It was also noted that socio-political associations could play an important role in fisheries management, as well as resource protection. This role could be further enhanced if policies were put in place to promote their participation and interests more.

5.6 Conclusions and lessons learned

By means of this initiative of improved information generation in support of management in a single province of Viet Nam, a number of key lessons, with wider application, have been learned.

5.6.1 Acceptance and realization of the need to improve communication flows

There now appears to be a wider acceptance and realization within central and provincial departments of MARD of the need to collect up-to-date information from coastal communities and involve broad stakeholder participation in planning and policy-making processes at central and local levels. The process applied was exemplary in many respects, beginning with a national level forum and then moving down through provincial and district levels to fisher communities collecting information, opinions and perspectives and then communicating the information collected to district, provincial and national level institutions.
5.6.2 The socio-economic situation of coastal fishing communities

Through the engagement of central and local level fisheries institutions, the relatively poor economic position of small-scale fishers in Quang Ninh has been highlighted and a strong contribution has been made to the policy debate on how these livelihoods can be protected and what must be done if the current trends in the deterioration of the resources continue.

5.6.3 The complexities of fisheries restructuring

The complexities of fisheries sector restructuring and the limitations of broad policies that promote overly simplistic solutions have been highlighted by this work. For example, the perception that aquaculture is a panacea for all households and coastal communities has been challenged through consultations with fisher communities that revealed the constraints on fishers’ involvement in aquaculture and cast doubt on the likelihood that household fishing effort can actually increase through this diversification into aquaculture.

5.6.4 Effects on policy and planning processes

Consulting with a wide range of fishers has demonstrated the benefit of including poor people’s perspectives in policy and planning processes. Although the objectives of this work did not anticipate that these improved information flows would necessarily result in immediate and measurable changes in policy or planning processes, towards the end of the pilot process such changes were reported to have begun. For example, it was found that stakeholder information concerning trash fish and wild seed harvesting was being used to influence local government policies on the promotion of multi-species culture of fewer polluting species.

In addition, the regular dialogue with stakeholders, implementers, planners and policy-makers appears to have created the conditions whereby previously awkward and controversial subjects such as the government policy of targeting offshore stocks could be reviewed more pragmatically and objectively.

5.6.5 Communication issues for remote communities

Government staff took the opportunity to use the dialogue process to disseminate information on fisheries laws and regulations. This highlighted the difficulties that many fisheries departments have in routinely disseminating their policies, rules and regulations on coastal fisheries. The communities that they have to reach with this information may be located in remote areas and are highly mobile. In Viet Nam’s case, the long coastline relative to total land area and the underdeveloped transport infrastructure makes the systematic collection and dissemination of information, a huge challenge. To reach isolated communities, greater use of mass media channels such as radio and TV is seen by many Vietnamese as essential. The rapid growth of internet access in Viet Nam (albeit mainly in urban areas at present) suggests that future consultation processes could achieve considerable cost savings through online interaction.

5.6.6 The limitations of participatory approaches

It is important that the limitations of approaches such as the one described in this report are recognized. Although issues such as the illegal fishing of foreign boats in coastal waters were discussed at the community, district and provincial levels, it is beyond the scope of fisher communities to engage in these issues and resolve them. Efforts to settle international conflicts can only really take place through regional dialogue between senior fisheries administration officials. Agreement on the management and exploitation of transboundary or straddling stocks is a particularly challenging issue in many areas and although it can be informed by community participation, realistically it can only be resolved at higher levels.
5.6.7 The sustainability of participatory approaches

The focus on a single district within a single province allowed for an in-depth understanding of the complexities of a local fishery and allowed considerable insight into the stakeholder situation. However, acquiring this level of understanding was expensive, both in terms of its logistical costs and the institutional staff time required. Although there were considerable benefits gained through the approach used, the cost effectiveness and sustainability of the consultative process could be called into question. As activities were largely funded through donor support, a true indicator of the impact of this process will be the degree of resource allocation committed by the government to support similar activities. At the time of writing this report, the real extent to which experiences gained through the Quang Ninh pilot project have altered the operational behavior of government fisheries institutions remains difficult to assess.
6 Conclusions: fishing for fishery knowledge – processes of improving the understanding of fisheries systems

If the diversity of the experiences recounted in these stories allows for any general conclusions, then it is the importance of dialogue and communication and the usefulness of allowing a free-flowing exchange of information among as many stakeholders as possible.

Much has been said about rights-based fisheries, fisheries co-management and ecosystem-based fisheries management with fisheries managers, policy-makers, scientist and researchers racking their brains about the meaning of each of these fisheries management approaches. In trying to find definitions and formulating “how-to” guidelines and handbooks on such fisheries management approaches, their essential ingredient often is overlooked, namely dialogue.

Whether talking of co-management and partnerships between fisheries stakeholders or of the adaptive nature of ecosystem-based fisheries management, the experiences from the efforts narrated above demonstrate that the fundamental nature of any fisheries management effort is the communication process among its various protagonists. Neither a partnership between fishing communities, fisheries managers, researchers and other stakeholders, nor the merging of the development goals of human well-being with that of ecological well-being through an ecosystem-based fisheries management approach would be possible without free-flowing information among the various partners in the management process.

These communication processes can take many different forms and can be designed according to a diversity of purposes: (1) to meet specific fisheries management objectives, as demonstrated by Thailand; (2) to inform local and national level fisheries stakeholders about their respective needs and aspirations for the fisheries sector; and to generate new information about local fisheries systems through participatory catch-reporting mechanisms as in Cambodia and Timor-Leste.

The experiences from these activities should encourage fisheries managers, scientists and fishing communities not only in these countries, but in all coastal areas in Asia and beyond, to actively seek such dialogue and information exchange as a basis for improving fisheries management.