

## 6.3 LEGAL REQUIREMENTS

### 6.3.1 Legislation of management regulations

#### Definition

Facilitate and support processes that enable fishery management measures to be formalised into legal instruments or documents whose conditions and consequences are well understood and can be enforced and monitored. Interventions could be conditions of local ordinances or international conventions such as CITES.

#### Uses

Managers should take appropriate actions to ensure that management decisions are properly set in to the legal framework of the managing institution (e.g. be it a government fishery service or a community group) so that they are duly respected and can be legally enforced. Through the process, regulations can be more specifically defined because the wording is carefully considered in a legal context. Fisheries enforcement officers can be empowered through regulations in legislation as they are less subject to fishers demanding partiality or leniency.

By facilitating management regulations into the legal framework, they are thereby endorsed by local, national, regional, international institutions. For example, regulations placed into local legislation carry thereafter the endorsement of the local legislative body, in addition to the fishery managers. Regulations ratified by international bodies, like CITES, oblige other organisations to abide by the regulations because non-compliance can be sanctioned in international meetings. Setting regulations into the legislative framework therefore promotes responsible action. In addition, management decisions placed into legislation beckon accountability, because the legal institution is responsible for prosecuting non-compliance.

The effectiveness of regulatory measures can be improved through dissemination of legislative regulations, as these are often made public. They are commonly accessible via fishery bulletins, libraries or the Internet.

#### Limitations

There may be poor legal support in some regions or countries for placing management regulations in to legislation in a timely fashion, or aptly prosecuting fishers, processors or exporters that breach the regulations. Similarly, limited capacity of fishery services (Section 2.3) or local management institutions may make it hard to clearly define the regulatory measures. They may, alternatively, lack the know-how or motivation to place management decisions into law.

Unfortunately, there may be much motivation by advisory committees or management agencies to impose certain regulations, but these may be undermined thereafter by political manipulation (and unwillingness) and corruption.

Legal advice may be limiting for many community-based management institutions to set regulations into correct legal frameworks that make them binding and allow offenders to be prosecuted.

#### How to implement

Initiate an assessment of policy and planning needs for the fishery. This should include a review of the processes by which resource management is placed into legislation, at the level of the managing institution. Find out what are the requirements of the legal system and the common timeframes for getting regulations set into legislation.

Draft the fishery regulations in a concise manner in simple terms that can be understood by everyone. Critically judge the wording for ambiguities or loopholes, whereby fishers, processors or exporters could argue around the wording to avoid prosecution. If possible, seek technical and legal advice (including appropriate instruments for penalties) once the fishery regulations have been drafted. Communicate

with decision-makers at a high level to seek their endorsement of the draft regulations and advice about the process for submission.

Once the wording of the draft regulations has been finalised, submit the finalised regulatory measures to the legislative council or government body.

## EXAMPLES AND LESSONS LEARNED

### Solomon Islands

In the past, fisheries management in the Solomon Islands has been reactive rather than proactive; usually addressing a problem after it had arisen. Previously, there was no formal management plan for the sea cucumber fishery despite its importance as an income source to rural coastal and island peoples and revenue generation for the national government.

In December 2006, the Permanent Secretary for Fisheries closed the sea cucumber fishery because of evidence of severe over-harvesting and stock declines. The plan was for it to stay closed until regulatory measures were developed for the fishery. This changed with the occurrence of an earthquake and tsunami in April 2007, which dramatically reduced the income of communities in rural areas, led to the fishery being opened in May. It was declared that an interim management plan for the fishery would be developed quickly, for 2007, and that the fishery would stay open until December 2007, after which it would be reviewed and operated under a more permanent set of management arrangements.

If the Solomon Islands government decides to implement a *National Beche-de-mer Management Plan* under its new *Fisheries Management Bill*, it is envisaged that management arrangements will involve two levels, national and community. National-level regulations will apply uniformly across the country or provinces (size limits, fishing closures, seasonal opening, etc.), while at the community level, communities will decide on area closures – or may decide to have closures for particular species; as long as they do not conflict with the national regulations.

Source: J.P. Kinch.

### Galápagos Islands, Ecuador

With the passing of the Special Law of the Galápagos (SLG) in March 1998, along with creating the Galápagos Marine Reserve (GMR), the SLG established a participatory and adaptive management plan for the GMR. This system promoted regulatory measures and interventions into legalisation as it empowered decision bodies to implement and enforce such regulations.

Any decision pertaining the management of the GMR must be evaluated first in the Participatory Management Board (PMB) which takes decision based on the consensus of the five major local stakeholders of the GMR (Fishing, Tourism, Management – Galápagos National Park Service (GNPS), Science, Conservation and Education, and Naturalist Guides). These decisions are then evaluated at a Ministerial level or Inter-institutional Management Authority (IMA), with decisions made under a voting system. The final resolution is then re-directed back to the GNPS, who has the mandate to put such decision into a legal framework (or “*Resoluciones*”) that will apply to the activity in question. This “*Resolución*” is then made public and it will contain the regulations and management tools to be used in the regulation of any activity.

Source: V. Toral-Granda.

## 6.3.2 International agreements and CITES

### Definition

Binding or non-binding arrangements between governments that promote cooperation towards common interests and objectives.

## Uses

Management and conservation of sea cucumbers might need international support because the geographic distribution of most species goes beyond political boundaries and trade involves international markets.

One example of international agreement towards the control of trade in species of conservation concern is the Convention for International Trade of Endangered Species (CITES). CITES aims to ensure that trade in wild animals is commensurate with their conservation. It does this by providing a legislative and regulatory framework for international cooperation in controlling trade of animals listing in Appendices I, II and III of the Convention (FAO, 2004). At present, *Isostichopus fuscus* of the eastern Pacific is the only sea cucumber species included in CITES, with Appendix III listing (Toral-Granda, 2008b). Listing of species under one of the three Appendices will afford certain levels of control on trade (FAO, 2004; Sant, 2006):

- Appendix I: offers the highest protection for species that are threatened with extinction from international trade. Trade of listed species is only authorized in exceptional circumstances.
- Appendix II: offers moderate protection for species that could become threatened if their trade is not effectively regulated. It does this by placing a condition on the trade of listed species, whereby countries must demonstrate that the trade is non-detrimental to the survival of the species in the wild. Only animals obtained in compliance with national laws can be traded.
- Appendix III: provides assistance to countries (or a “Party”) in the enforcement of its national trade regulations, e.g. if illegal trade is an issue. It does this by obliging other parties to apply their own domestic laws to ensure that trade is consistent with the laws of the State (i.e. country) of origin for that species.

One of the objectives of CITES is to safeguard the use of aquatic species in food security, employment and income generation (FAO, 2004). A common use of international agreements, such as CITES, is to deter illegal fishing and trade that jeopardise livelihoods or the survival of species on which they depend (Bruckner, 2006a). For instance, countries may sign agreements (e.g. CITES Appendix I or Appendix II listing) to ban or limit the trade of certain sea cucumber species, although there are no examples of this at present. Some sea cucumber species are relatively rare and some high-value species have been overfished in most localities. CITES Appendix I listing for such species would be one way to protect them from extinction. Such conventions also help to ensure that fishing practices are sustainable to allow exports, enhance opportunities for technical assistance and capacity building and raise awareness among stakeholders and decision-makers (Bruckner, 2006a; Toral-Granda, 2008b).

International agreements may place certain restrictions on trade through requirements for trade reporting (e.g. through CITES Appendix III) (Toral-Granda, 2008b). This can improve the standardization of trade codes and quality of trade reporting. CITES, in particular, can create an impetus for harmonising trade codes and data collection among countries (Toral-Granda, 2008b). International trade in CITES-listed species is controlled by a system of trade permits and certificates (FAO, 2004).

International agreements can help enforce national regulations. This arises through obligations and responsibilities to enforce certain fishing, processing or exporting practices. They can also be a channel for international scientific collaboration. The agreements can promote standardization of research methods and international scientific cooperation.

## Limitations

Lack of political will to pursue agreements will be a significant hurdle for many managers of sea cucumber fisheries. Politicians may be unwilling to risk future constraints to fishing that international agreements may pose. There may also be conflicts of interests between potential partner countries. Where there is political will, agreement may be based on political reason and not on sound management.

Agreements may not be put into practice at the national level. They may present an administrative or economical burden (unfunded mandates) (Toral-Granda, 2008b). Implementation of the agreements may require unacceptable costs, or be met with capacity and logistics constraints at the local and national level. For example, CITES listing can place a burden on both the exporting and importing countries by requiring permitting, training for customs and trade officers for trade interdiction and specimen identification and other regulatory measures for compliance (Bruckner, 2006a; Toral-Granda, 2008b).

The problem of identifying specimens of listed species in international trade is a significant one (FAO, 2004), especially so for sea cucumbers which can be difficult to identify without proper training. Technical needs of implementation such as guides for species identification and the work to report non-detriment findings (for Appendix II listed species) require a certain level of investment in administration and science (Sant, 2006). Inability to correctly identify sea cucumbers, or their organs, by customs and other officials can present an opportunity for illegally obtained animals to be fraudulently labelled or laundered under other names (FAO, 2004).

In cases where signatory countries are non-compliant with CITES regulations or reporting timeframes, the CITES Secretariat undertakes consultation with them about the problems. The challenges in complying with CITES should not detract countries from being signatories. Some assistance may be made available by CITES to countries, in certain cases, to help them in implementing the Convention (FAO, 2004).

In cases where stringent protocols for declaring exports are in place, such as in the Seychelles, controls may be sufficient already to ensure responsible fishing and trade (Aumeeruddy and Conand, 2008). Choo (2008b) discussed that CITES listing of some sea cucumbers may cause serious socio-economic problems in the Philippines. When an animal is listed under CITES, the national legislation prohibits trading of the species irrespective of the Appendix within which it is listed. In such cases, CITES listing of certain sea cucumber species within Appendix III could deprive fishers of an income and spur some to fish illegally and trade sea cucumbers on the black market (FAO, 2004; Choo, 2008b).

As yet, there are few regional and international agreements on sea cucumbers by which to use as templates for new ones. Fishery managers may be unable to initiate such agreements because of the time required in literature searching and review to write and develop the agreement. Lessons learned from listing of *Isostichopus fuscus* on CITES Appendix III are invaluable in this regard (Toral-Granda 2008b).

## How to implement

Fishery managers should help to broker the process of developing international agreements for the exploitation and trade of sea cucumbers, as advocated in the Code of Conduct for Responsible Fisheries (Section 3.1). What is the national and international legal framework by which agreements can be made and enforced? Who in the country would need to sign the agreement and what can be done to brief them so they can make an informed decision?

Obtain reliable assessments of the national status of the fishery and the global status of the species being fished. See if there are any problems or limitations to trade that could benefit from an international agreement. Studies using underwater visual censuses of the sea cucumber stocks should give an indication of species that are critically

depleted, rare or endemic (Section 6.1.2). International agreements may be a useful tool in preserving these stocks. For the different CITES listings, the fishery manager should find out if any of the species in the fishery are threatened with extinction or could become extinct if the current trade practices are not adequately regulated.

Examine the advantages and disadvantages of an international agreement, like CITES. Assess what the likely costs will be to develop the agreement and implement it. For example, for CITES Appendix III listing, the country with the listed species must issue an export permit that is endorsed by the management authority once it is satisfied that the specimens were obtained legally. Other Parties (i.e. signatory countries) must accompany a Certificate of Origin with exports of that species, if they have not also listed the species. Importing countries must confirm that imports of that species have an export permit of Certificate of Origin. Re-exports also require similar certification (Sant, 2006). Managers should get a clear definition of terms of reference between parties. They should also consult literature explaining the implications of CITES listing (e.g. FAO, 2004; Bruckner, 2006a).

Form a good technical-legal committee that will draft the agreement. It may be best to seek sound legal and technical advice and use templates based on other agreements. Managers wanting to propose certain sea cucumber species for CITES Appendix III listing can do so unilaterally at any time through their respective government body. On the other hand, proposals to list species in Appendix II will undergo a review and require two-thirds majority support to be accepted at a meeting of the Conference of Parties (Sant, 2006).

Put in place monitoring measures to assess whether the conditions of the agreement are being implemented. For example, develop a schedule and methodology for checking beche-de-mer exports and export data to ensure that contraband species are not being traded.

## EXAMPLES AND LESSONS LEARNED

### Galápagos Islands, Ecuador

Ecuador is the only country that has listed a sea cucumber species (*I. fuscus*) in a CITES appendix. This species was included in Appendix III on 16 October 2003 and since then most of the catches from capture fisheries from the Galápagos Islands have been recorded in CITES permits. However, in mainland Ecuador there are both capture fisheries and aquaculture production that has been exported to the oriental market, with no records of a CITES permit. Mainland exporters and fishers claim that the species collected is not *I. fuscus* – this illustrates one of the problems of the listing with little or no training for export agents, border patrol and custom officers.

The listing of *I. fuscus* in CITES Appendix III has shown advantages and disadvantages (Toral-Granda, 2008):

Advantages:

- (i) Certainty of the legality of the catch of the exported goods
- (ii) Increased awareness of the need to conserve and manage sea cucumber populations
- (iii) Possibility of identifying trade bottlenecks where illegal catch may be laundered to
- (iv) Better opportunities for technical assistance, targeted research and capacity building
- (v) Creating and putting into place standardized and comprehensive trade reporting codes and data gathering amongst countries
- (vi) Catch and export data are centralized in one area, allowing faster analysis and quicker returns for the analysis of trade bottlenecks
- (vii) Understanding of the trade route when it leaves Ecuador

- (viii) Understanding that international trade is the major force behind the exploitation of *I. fuscus* in the GMR
- (ix) Curtailing international trade by means of an attached CITES permit that ensures the legality of the catch.

Disadvantages:

- (i) Increased burden to CITES administrative officers (i.e. processing of permits, compilations and submission of annual reports to the CITES Secretariat)
- (ii) Increased costs to train and educate managers, border patrol and custom officers
- (iii) Problems in identification to species level, as many processed sea cucumber look alike
- (iv) The lack of communication between the Galápagos and mainland Ecuador CITES Administrative Authority offices, has created some conflict of interest and delayed response in certain cases
- (v) Aquaculture production from mainland Ecuador claims that their species in trade is not *I. fuscus*, hence all exports leave the country without a permit. This could be solved if there will be more trained personnel in mainland Ecuador that could clearly identify the species traded
- (vi) Delay in acquisition of the CITES Secretariat trade reports on CITES species

Currently, Ecuador has no intentions on up-listing *I. fuscus* to any of the other two Appendices. Perhaps greater success with such listing could be achieved if all *I. fuscus* range States would decide to include the species in the same appendix, so as to deter illegal shipments from other countries and to promote greater awareness and conservation.

Source: V. Toral-Granda.

### Pacific, Micronesia

An example of a non-binding international agreement of relevance to the conservation of sea cucumber stocks in the Pacific is the “Micronesia Challenge”. The “Micronesia Challenge” is a regional intergovernmental initiative in the western Pacific region aimed to facilitate the effective conservation of marine and forest resources in Micronesia. On 5 November 2005, President of Palau Tommy E. Remengesau Jr. called on his regional peers to join him in the “Micronesia Challenge”, which would conserve 30 percent of near shore coastal waters and 20 percent of forest land by 2020. Joining the initiative were Palau, the Federated States of Micronesia and Marshall Islands and the United States of America territories of Guam and Northern Mariana Islands. These nations and territories represent nearly 5 percent of the marine area of the Pacific Ocean and 7 percent of its coastlines.

Source: K. Friedman and *The Nature Conservancy*.

## 6.4 ASSIGN ACCOUNTABILITY

### Definition

Assigning to named persons, or entities, the obligation to demonstrate and take responsibility for performance of the fishery in light of commitments and expected outcomes.

### Uses

Assigning accountability for the success or failure of management provides a foundation for decision-making process. It promotes more commitment to act responsibly and take ownership of the consequences for poor judgement in fisheries management. Accountability gives strength to the management system and credibility to participants.



Accountability can help in identifying the decision-makers in co-management or community-based management systems. It is used not just to lay blame on those responsible if the stocks collapse, but rather to identify mistakes and errors so that they can be remedied (Grafton *et al.*, 2007).

Accountability also extends to the provision of scientific information. Nominating who is accountable for scientific advice will afford more care in the advice given, how it is worded and the associated conditions or uncertainties. Likewise, there may be official accountability for communication or enforcement of regulations. For example, fisheries officers may be made accountable for ensuring that all fishers and processor are aware of the regulations, whereas customs officers can be made accountable for checking shipments of beche-de-mer for undersized product or shipment of contraband species.

### Limitations

Turnover of decision-makers, e.g. by elections or political appointments, erodes clarity about who is accountable for fishery performance. Without strong governance, accountability may foster a reluctance to take hard decisions. Conversely, there may be a lack of political will to take actions against those accountable for decisions, scientific information, surveillance or enforcement.

Qualified people, such as fisheries scientists, might be deterred from participating in management if they will be held accountable for inaccuracies in their advice.

### How to implement

The legal framework by which people can be held accountable and penalised needs to be understood. What are the legal consequences for improper decisions, actions or advice? Likewise, the legal framework and process for assigning accountability should be determined and understood.

Next, define clear reference points by which accountability can be judged (Section 3.4). There should be little room for interpretation about the reference points. Define the duties and responsibilities of various participants in the management process.

Set clear performance indicators at various levels: ecosystem, fish stocks and economics so as to identify the effects of regulatory measures and management actions (Grafton *et al.*, 2007; Section 3.4). Ideally, operational accountability in the management of the fishery should rest at the management level, with the people most qualified to make the decisions, but politicians should also be made accountable for ensuring adequate funding and the governance structure. Ensure that those accountable and responsible have the appropriate authority to make decisions (Grafton *et al.*, 2007).

Define and implement meaningful sanctions, or remedial action, for breaches of responsibilities and enforce these consistently. Such sanctions should be clear to participants at the onset. Ensure that best practise and best available information protects participants in case of failure (to encourage experts to participate).

Promote transparency by making the accountability public. Also, provide a forum for feedback about accountability.

## EXAMPLES AND LESSONS LEARNED

### Accountability in fisheries co-management: lessons from Asia

“Co-management means having a process in which business is conducted in an open and transparent manner. All partners must be held equally accountable for upholding the co-management agreement. The partners have common access to information. Venues are provided for public discussion of issues and to reach consensus. There needs to be

accepted standards for evaluating the management objectives and outcomes. Without strong accountability, decision-making can become corrupt and arbitrary. A body outside of the community, such as government or an NGO, may need to monitor and evaluate the co-management process. This outside body can serve to provide checks and balances to make the process more accountable in a formal way. Formal agreements will require a structure for legal accountability among the partners.”

*Source: Pomeroy, Katonb and Harkes, 2001.*

## 6.5 ENFORCEMENT

### Definition

Intervention to ensure that users comply with management regulations and enable penalties to be asserted to offenders.

Enforcement may entail physically checking catches, gear used on boats, or the areas being fished, and imposing fines or other sanctions if the catch or fishing gears are not in accord with the regulations.

### Uses

Enforcement of regulations is an often-neglected aspect of fisheries management (Hilborn, Oresanz and Parma, 2005). Its goal is to ensure that all actors in the fishery, from fishers to exporters, comply with management regulations. For example, enforcement can serve to protect resources in areas closed to fishing (e.g. within no-take reserves), or protect small individuals (through enforcement of size limits), or protect certain species (via species-specific bans or TACs). Most usually, some form of enforcement is needed for the management measures to be followed.

A further use of enforcement is to confirm that fishing practices correspond with management regulations and principles. Managers are called upon to implement effective fisheries monitoring, control, surveillance and law enforcement measures (FAO, 1995; Figure 13, Section 3.1). Breaches of fishery regulations can be shown via reports from enforcement officers to allow managers to adapt the management regulations.

Enforcement can also enhance compliance by providing an example that offenders will be prosecuted for breaches. For instance, if one processor/exporter is fined, or has his/her licence revoked for one year, due to undersized beche-de-mer being found in bags for export, other processor/exporters will likely comply more vigilantly.

### Limitations

A common reason, or excuse, for poor performance of management in sea cucumber fisheries is a lack of resources for adequate enforcement. This arises commonly in top-down (government-run) management systems when the responsibility for enforcement resides with the national fisheries agency, where the geographic scale of the fishery is large and where inadequate funds are given by government. There are commonly too few funds to cover the employment of enough enforcement officers and inspection costs, particularly for inspections at sea. Alternatively, the managing body may be constrained by technical capacity of the fishery officers to conduct inspections and understand the laws (see Section 2.3). In some sea cucumber fisheries, fishery officers or customs officers need to identify many different species, which are in a processed form.

Enforcement meets conflict with fishers if they do not understand or have not been made aware of the regulations. Conversely, it may be unclear who has authority and responsibility for enforcement. These problems are particularly evident when there are multiple regulatory measures in the fishery, or where the regulations vary from



one region to another. Conflicts may arise if fishers, processors or exporters argue that they have not been informed about the regulations. Simple and consistent fishery regulations will be easier to enforce.

There may be a lack of political will to enforce the regulations (i.e. prosecute offenders). In addition, sanctions may not be appropriate or severe enough to discourage offenders. In some countries, there may be opportunities for corruption of the enforcement process, undermining its effectiveness for sustaining the resource.

### How to implement

Fishery managers should do the following:

- 1) Determine the technical and human-resource capacity of the management institution.
- 2) Assess whether skills, personnel time and fund are available for fishery officers, customs agents, or community “sea rangers”.
- 3) Provide sufficient funds for the enforcement, as advised in the Code of Conduct for Responsible Fisheries (FAO, 1995).
- 4) Assign the authority for enforcement – e.g. authority to inspect sea cucumbers of fishers at sea or beche-de-mer in bags for export. This may be given, for example, to officers in fisheries departments or conservation departments, or to local “sea rangers” in communities.

Problems arise when fishery officers and research staff have the task of enforcing regulations in addition to their responsibilities in management (King, 2007). Compliance is usually higher when stakeholders have been involved in developing the management and better again in community-managed fisheries (King, 2007). Where centralised agencies are vested with the task of enforcement, separate sections for compliance should be formed. For example, within Seychelles Fishing Authority (the managing agency), a Monitoring, Control and Surveillance section is responsible for random inspections of sea cucumbers at processing factories and inspection of consignments of beche-de-mer before export (Aumeeruddy and Conand, 2008). The enforcement officers should be given training to understand the regulations, the methods they can use to inspect sea cucumbers or fishing activities and the rights of the actors. If locally relevant identification guidebooks are not available (see Section 6.1.1), prepare some suitable reference material, even simple sheets for identifying fresh and dried sea cucumbers. Moreover, support and coordinate training sessions or workshops in identifying the various species in different forms. The fishery manager may also need to support or facilitate the governance structures of the communities and stakeholder groups so that enforcement is effective.

Decide how the regulations will be enforced. For example, will there be inspections at sea and inspections of processed sea cucumbers before export? Inspecting processed and semi-processed sea cucumbers at processing centres will generally be easier than inspecting landings of fishers, and will have logical flow-on effects to fishing activities (Friedman *et al.*, 2008a; Purcell, Gossuin and Agudo, 2009a). In contrast, inspections at sea require several people, involve more travel time and incur substantial costs in boat use and maintenance. Inspections of fishers may therefore be best at landing points, if these are centralised (e.g. at town boat ramps). The use of Vessel Monitoring Systems (VMS) can be an auxiliary tool for enforcing space-based management measures, especially in more industrialized fisheries.

Develop inspection sheets to record what has been done and said. The enforcement body should also establish a periodicity for inspecting catches and exports of sea cucumbers – who will do the inspections and how often.

Set out the penalties for various infringements, which may consist of a range in penalties depending on the severity of the infringement. Find out from fishers or communities what penalties will be realistic and a deterrent for infringements of

various regulations, as well as the potential conflicts in enforcement and applying penalties. For example, a fisher with two undersized sea cucumbers would naturally expect a less severe penalty than one with two hundred. For small-scale fishers with community-level management institutions, penalties may be the removal of certain privileges or payment in traditional commodities (pigs or crops). In more modern fisheries, penalties could be monetary fines, loss of boat, cancellation of fishing licence for one or more years, or a partial loss of fishing privileges for a certain time (e.g. a reduction in their quota by a certain percentage in the following year). Above all, penalties should be clear and imposed consistently.

Ensure that all actors in the fishery (i.e. fishers, processors, exporters) have been given ample notice of the fishery regulations and understand how the sea cucumbers or their activities may be inspected and by whom. They should also be told about the wording of the laws and the penalties that can be imposed.

### EXAMPLES AND LESSONS LEARNED

#### **Bolinao, The Philippines**

The municipality of Bolinao through its organized Bantay-Dagat has been primarily responsible for the enforcement of fishery laws in its municipal waters. Regular patrolling duties are allocated by the municipality and the enforcers are also linked to an inter-Local Government Unit system of enforcement among several municipalities. On the other hand, the monitoring of landed catches is carried out by the Bureau of Fisheries and Aquatic Resources (BFAR). The municipality of Bolinao admits to technical and financial limitations to conduct regular monitoring. Recently, a Conservation Partnership Agreement and other instruments appear to have facilitated better compliance to the fisher registration and licensing.

*Source: R. Gamboa.*

#### **Papua New Guinea**

Papua New Guinea manages its sea cucumber fishery via the 2001 *National Beche-de-mer Management Plan* through the statutory authority, the National Fisheries Authority (NFA). Management regulations in the *National Beche-de-mer Management Plan* include licensing and reporting requirements, access restrictions, minimum legal size limits, gear restrictions, a closed season from the 1 October to 15 January each year, and total allowable catches (TACs) at the Provincial levels.

Despite these management mechanisms, monitoring and enforcement costs incurred to the NFA have progressively increased. Most cases are brought forward to the NFA include illegal buying (and storage) and seizure (and shipment). The activities infringe the management plan, which states that the beche-de-mer fishery in Papua New Guinea is reserved for the use of citizens only, and only Papua New Guinea citizens and Papua New Guinea citizen enterprises may hold an export licence to trade beche-de-mer. Shipments of beche-de-mer products between provinces is not permitted except with written authorization from the Managing Director of NFA.

*Source: J.P. Kinch.*

## 6.6 EDUCATION AND COMMUNICATION WITH STAKEHOLDERS

### **Definition**

The exchange of information about the management of sea cucumbers in order to improve stakeholders' understanding and acceptance of management principles and to incorporate their concerns and knowledge in the management process.

Communication with fishers means far more than just informing them of the fishing regulations – it also allows for discussion about the biology of sea cucumbers (e.g. to understand stock recovery), information on the status of stocks in the fishery

and principles behind the management regulations (Figure 33).

### Uses

Communication with fishers and processors has an obvious use in ensuring that they know the fishery regulations, but it should go much further (Purcell, Gossuin and Agudo, 2009a). Communication about regulatory measures should be accompanied by some education from fisheries officers about why the regulations are in place and how they act towards sustainability and efficiency of the fishery (Figure 13; Section 3.3). The process of educating all stakeholders in biological and management principles helps to dispel misconceptions. Giving stakeholders a

FIGURE 33  
A sociologist from a sea-ranching research project in Mindanao, Philippines, discusses with members of a fishing community about the potential benefits and uncertainties of growing hatchery-reared sandfish (*Holothuria scabra*) in leased coastal sandflats



PHOTOS: R. GAMBOA

FIGURE 34  
Communicating sea cucumber fisheries management with artisanal fishers in Bougainville, Papua New Guinea (left) and Pangasinan, Philippines (right)



PHOTO: J.P. KINCH



PHOTO: S.W. PURCELL

better understanding of management principles and about the basic reproductive biology and ecology of sea cucumbers will foster better adoption and compliance of regulatory measures (Figure 34). It is only when the regulations make sense that people will follow them unreservedly.

A communication programme within the fishery creates an enabling environment for better management decisions, through consensus building. Informed stakeholders are in a better position to manage their resources in co-management and community-based management systems. It also provides a vehicle for feedback to identify issues of stakeholders and information that might not be gained from underwater visual census or landing surveys. Scientists and managers need to appreciate the use of fishers' knowledge about sea cucumber populations and marine ecosystems (FAO, 2003; Section 3.1). Here, we use communication in the broad sense to include dissemination of leaflets, radio programmes, roving theatrical presentations, local presentations and newspaper articles or comics.

### Limitations

Communication programmes need people with skills in communication and in-depth understanding of the fishery, biology and management principles, which do not

always go hand in hand. Effective implementation is therefore as significant a hurdle as development of the communication strategy.

In some countries, there may be many different dialects or cultural disparities among fisher groups. Education materials may, therefore, need to be tailored to suit cultural sensitivities or local language dialects. Science has its own language, and the biological information on reproduction and populations' dynamics of sea cucumbers (Section 2.1) needs to be "translated" into simple terms that can be understood by non-scientific stakeholders.

There may be a lack of adequate and appropriate education materials. Managers may need to invest in developing these.

### How to implement

Develop a communication strategy of how fishers will be informed and what methods will be most cost-effective. Set aside funding within the fisheries management system for communication and education. Train fishery officers in communication techniques and provide them with the resources (materials, travel expenses) to visit fishers and processors regularly. A communication plan should set a periodicity at which fishery officers and other agents interact with fishers.

Identify existing education materials used in other fisheries and seek to adapt these to the local fishery. For example, comic books of fishers discussing the principles of fishery management regulations in local languages may prove more effective (e.g. *Closed Season*, published by the Papua New Guinea National Fisheries Authority). If necessary seek assistance from appropriate agencies to assist in the development and delivery of appropriate (and targeted) education and communication strategies. Try to gather feedback from the fishers, i.e. using structured data sheets, about changes in the species, sizes, catch rates and sites where they fish.

Trial the educational material on some fishers and adapt them as needed. Monitor the effectiveness of education by questionnaires to see if fishers have a correct understanding of basic biology of sea cucumbers and the principles behind the management regulations.

## EXAMPLES AND LESSONS LEARNED

### Papua New Guinea



Poster designed by the National Fisheries Authority, Papua New Guinea.