

# Policy options

**This section aims to identify feasible policy options that target key components identified in the Causal chain analysis in order to minimise future impacts on the transboundary aquatic environment. Recommended policy options were identified through a pragmatic process that evaluated a wide range of potential policy options proposed by regional experts and key political actors according to a number of criteria that were appropriate for the institutional context, such as political and social acceptability, costs and benefits and capacity for implementation. The policy options presented in the report require additional detailed analysis that is beyond the scope of the GIWA and, as a consequence, they are not formal recommendations to governments but rather contributions to broader policy processes in the region.**

In this analysis, two broad areas of policy are discussed, relating to the main concerns addressed in this report: (i) Freshwater shortage and (ii) Unsustainable exploitation of fish and other living resources, through integrated coastal area planning and resource management and conservation. These policy areas have been addressed at the regional and, to varying degrees, the national level throughout the Pacific Islands. The Pacific Islands Regional Ocean Forum (PIROF), held in Suva, Fiji in February 2004, resulted in draft Framework for Integrated Strategic Action, the elements of which are in agreement with the policy options proposed in this study. The difficulty, however, is finding ways and means of translating these well-conceived regional and national policies into action. Capacity building, awareness-raising, involvement of all stakeholders in planning and decision-making, paradigm shifts in governance and the law, and political will are all important if these policies are to be implemented. They cut across the GIWA concerns and issues addressed in this report.

The region has for almost 60 years adopted a regional approach to the similar concerns identified under GIWA. Policy issues within the

Pacific Islands region are addressed by consensus, and major regional programmes are implemented by inter-governmental organisations or other bodies following a sometimes exhaustive consultative process. South and Veitayaki (1999) provided a detailed analysis of how these various regional approaches have led to workable arrangements in response to global initiatives. In the post-UNCED, Barbados and WSSD era the regional approach has continued and strengthened. In the early 1990s, in preparation for UNCED, most of the Pacific Island nations developed detailed National Environment Management Strategies (NEMS) for dealing with environmental issues, and these have laid the foundation for subsequent regional programmes and activities, such as the GEF-funded International Waters (IW) Programme currently being implemented by the South Pacific Regional Environment Programme (SPREP), as well as national programmes. The IW project was developed through an exhaustive national and regional consultation process which led to the Strategic Action Plan for the International Waters of the Pacific Small Island Developing States (SPREP 2001a).

On the surface, therefore, it would appear that the Pacific Island countries have the right mechanisms in place to develop policies needed to address GIWA concerns, either collectively, or at the national level. Unfortunately, however, this is not the case since there is great variation among them in terms of capacity. Whereas some governments have established Environment or Fisheries sections or have developed Sustainable Development Acts, many others have not. Most of the governments inherited colonial systems of government that remain largely intact, with Westminster-style, French or U.S. forms of government. This means that for many, hierarchical departments remain fiefdoms that compete for scarce resources, and integrated decision-making is the exception, not the rule. Scientific capacity is well below what is needed, school education systems often remain tied to those of far-off countries, and public awareness of issues is often uneven or lacking.

# Freshwater shortage

Freshwater resources in the Pacific Islands are limited on the larger islands since, with the exception of a few nations (Papua New Guinea, Solomon Islands, Fiji) large river catchments are lacking. Great variations in flow rate are caused by catastrophic phenomena such as cyclones, and many watersheds are subject to high levels of run-off because of poor land use, clearing of native forest, mining and other activities. Water resources are finite on all atoll countries, and are subject to increasing depletion or contamination. Rainfall is highly variable by location, season and year, with many countries experiencing drought or floods. Many of the small atolls of Kiribati are uninhabitable because of a lack of potable water. Human habitation in the Pacific Islands has been governed by the availability of freshwater since the islands were first colonised around 3 500 years ago. Contamination of freshwater supplies by pollution from industry is common in urban areas, and standards in water use, treatment and protection of supplies are weakly applied. Rapidly increasing urban populations are placing unprecedented pressures on water supplies, as demonstrated by the city of Suva, where water cuts are frequent and distribution systems are old and inadequate. These problems have been widely recognised in the Pacific Islands, and have resulted in the development of a Regional Action Plan for use and conservation of freshwater.

While many Pacific Island countries have regulations for the use, treatment and conservation of catchments and water supplies, these are difficult to enforce because of traditional ownership of the land and resources, and inadequate consultation with traditional owners in the development of policies.

The United Nations has a long-standing regional commitment to water, and this responsibility now rests with the South Pacific Applied Geoscience Commission (SOPAC), through their Secretariat based in Suva, Fiji. SOPAC, like other IGOs in the Pacific Islands region, develops its annual workplan through a regional process of consultation, addressing concerns raised by their member countries through the development of national and regional projects which are carried out with support from donor countries and various agencies. There is also a Technical Advisory Group (TAG) to SOPAC which supports in-depth discussions on matters of regional and national importance.

The Pacific, perhaps more than any other region, has clearly articulated the challenges it has to address to achieve sustainable water management. The region has developed a strategic and holistic approach to overcoming these challenges, as articulated in the Pacific

Regional Action Plan on Sustainable Water Management (SOPAC 2002). A number of Pacific Island countries are also preparing their National Plans of Action (NPAs) under the Global Program of Action for the Protection of the Marine Environment from Land-based Activities (UNEP/GPA), through the assistance of the South Pacific Regional Environment Programme. These NPAs will include important strategies on waste management.

The Pacific Islands region has also developed a regional partnership, known as the Pacific Type II Partnership on Sustainable Water Management, and an inter-regional Small Island Developing States partnership with the Caribbean, known as the Joint Caribbean Pacific Programme for Action on Water and Climate (JPfA) designed to implement this strategic approach.

Without additional resources, national and regional activities in this sector cannot continue. The priorities that have been identified through the national and regional consultations are contained in the Pacific Regional Action Plan for Sustainable Water Management, 20 actions of which form the JPfA, common to the Caribbean and Pacific.

## Policy options

In July 2002, 18 Pacific Island countries formally endorsed the Pacific Regional Action Plan on Sustainable Water Management, 12 countries at Ministerial level. This Action Plan (SOPAC 2002) identified specific actions to address priority issues and constraints to achieving sustainable water management. The Pacific Wastewater Policy Statement and the Pacific Wastewater Framework for Action (Bower et al. 2002) are the two regional policy and action documents that provide a structure to regional and national interventions on wastewater management. Most of the policies are directly linked to the root causes identified in the causal chain analysis, and the Task team strongly endorse, and recommend that they will be implemented by Pacific Island countries.

### Short-term options

Short-term actions recommended under the Framework for Action are:

- Identify water pollution sources and undertake preventative and corrective steps, including financial penalties for environmental and water degradation (Key Message 3: Action # 3: Point 6) (SOPAC 2002);

- Conduct environmental impact assessments as an integral part of planning for development projects to ensure environmental values and objectives are properly considered (Key Message 3: Action # 3: Point 7) (SOPAC 2002);
  - Implement strategies to utilise appropriate methods and technologies for water supply and sanitation systems and approaches for rural and peri-urban communities in small islands (Key Message 2) (SOPAC 2002);
  - Further pilot projects in different island environments to determine appropriate low-cost on-site sanitation technologies (e.g. compost toilets, gravel bed hydroponics or constructed wetlands) (Key Message 2: Action # 10: Point 1) (SOPAC 2002);
  - Further applied research to establish guidelines for 'safe distances' (buffer zones) for existing sanitation options in different island environments (e.g. septic tanks, pit toilets) (Key Message 2: Action # 10: Point 2) (SOPAC 2002);
  - Increase government, donor and community awareness of poor sanitation impacts on water resources and public health (Key Message 2: Action # 10: Point 3) (SOPAC 2002);
  - Governments and regional organisations, the private sector and NGOs will actively cooperate to ensure that wastewater management policies and plans are integrated into the national development policies and plans and other cross-sectoral initiatives (Guiding Principle 1: Policy 1.7) (Bower et al. 2002);
  - Governments, service providers and NGOs will ensure rural and urban communities will be given opportunities for active participation in the choice, development and implementation of wastewater and sanitation projects and on-going operation and maintenance of its facilities (Guiding Principle 4: Policy 4.4) (Bower et al. 2002);
  - Service providers will take into account traditional knowledge and practices complemented by new approaches to wastewater management (Guiding Principle 4: Policy 4.6) (Bower et al. 2002).
- Governments will develop national wastewater and sanitation policies and regulations that are consistent with international and national laws, regulations, technical standards, and obligations (Guiding Principle 1: Policy 1.2) (Bower et al. 2002);
  - Governments will develop and implement appropriate wastewater and associated regulatory frameworks, compliance and enforcement requirements that benefit the specific cultures, customs, economies and environment of the people of the Pacific (Guiding Principle 1: Policy 1.3) (Bower et al. 2002);
  - Governments will ensure that wastewater technologies and related infrastructure are appropriate to meet national and local priorities and needs, within the constraints of available finance and other resources, while recognising the need for protection of human health and the environment (Guiding Principle 2: Policy 2.2) (Bower et al. 2002);
  - Planning of wastewater facilities will ensure acceptable access for all, with special regard to women, the disadvantaged, the disabled and those in rural and remote communities (Guiding Principle 4: Policy 4.5) (Bower et al. 2002);

### Medium to longer-term options

Medium to longer-term strategies under the plan are:

- Develop catchment management plans for the rational allocation, use and protection of water resources. This may include the establishment of catchment management, protection and buffer zones (Key Message 3: Action # 3: Point 3) (SOPAC 2002);
- Apply best management practices to minimise impacts from activities such as logging, cultivation and mining (Key Message 3: Action # 3: Point 4) (SOPAC 2002);
- Implement strategies to improve the management of water resources, and surface and groundwater catchments (watersheds) for the benefit of all sectors including local communities, development interests and the environment (Key Message 3) (SOPAC 2002);

### Progress

In Fiji, the need to address important water and land-use policy issues has been recognised through the establishment of a variety of recent initiatives. For example, Fiji is currently developing an inter-sectoral National Land Use Policy and a National Code of Logging Practice has been developed to strengthen moves towards sustainable forest management. In addition, the Fiji Government has convened its first inter-sectoral, high-level National Water Committee and is addressing catchment management problems by establishing and allocating additional resources to a new section dedicated to solving land and water usage issues.

At the regional level, the GEF-funded and SPREP-implemented International Waters Project includes important strategies addressing freshwater. The implementation of the SOPAC Action Plan is being facilitated through the establishment of case study sites in a number of different countries in the Pacific Islands region. The establishment of these sites is critical for the sustainability of these initiatives once IW project has concluded. In addition, links between the IW project and the SOPAC Action Plan should be developed and strengthened wherever possible.

### Barriers to implementation

Many of the actions proposed under the SOPAC (2002) plan will require difficult and sometimes socially unpopular decisions by governments. Using the example of Fiji, for policies to work, there is a need to identify the key stakeholders and to involve them in the processes, like for example, the land-owning units "mataqali", who own the land and whose activities such as logging, agricultural cultivation and

other land-based activities are of their own choice. As seen in the causal chain analysis for Rewa and Ba river catchments, the traditional landowners have every right to access their land and so policies will have to be made with their agreement. It is noteworthy that much of the market gardening that takes place in the Rewa catchment is carried out by Chinese, a disenfranchised group who would be completely marginalised if stringent land use policies were introduced.

The importance of traditional ownership of land and resources in Fiji has taken on increased prominence since the 2000 coup, and the “blueprint” developed by the Fiji Government has many elements that favour Fijian development over other ethnic groups. In a country where approximately half of the population is Indo-Fijian, the potential problems of this policy are obvious.

The private sector has to be conscious of potential medium-term changes that will result from policies that will work towards sustainable use of water supplies. Policies will need to be built into National Development Plans, and policies that favour the development of integrated water management strategies could have some negative impacts, and these would have to be anticipated and dealt with. For example, sustainable forestry or agriculture policies could create some reductions in employment opportunities in those sectors and so alternative employment or opportunities would need to be developed to counteract these losses. On the other hand, unless appropriate policies are put in place and implemented, the continued degradation of catchments and disruption of water supplies to rapidly growing populations will have long-term negative effects.

A common theme that was seen throughout the Pacific was the need for capacity building, and for awareness raising at all levels of society, on matters relating to proper wastewater treatment and sewage disposal practices.

Human factors such as population density, land use and sanitation methods have a large impact on the availability of water, the microbiological and chemical quality of water supplies and impacts on the freshwater resource. In addition, modern technologies are brought into these countries through many different programmes, but oftentimes these technologies are inappropriate for small islands due to the fact that many Pacific Island cultures still maintain much of their traditional lifestyles and value their traditions highly (e.g. the compost toilet still has not gained much popularity amongst the islanders). In some atoll countries, people traditionally use the beach as a toilet. When numbers are small, this is not a serious problem, but in areas with high population densities it becomes a serious pollution and health risk.

On most of the Pacific Islands, climate and water resource conditions vary considerably due to their locations, their topography, and their sizes and geology. Water supply for local communities is the most important water use, and approaches to provision of water supplies vary according to availability and sustainability of water resources. The implementation of the SOPAC (2002) plan will take much longer in some countries than in others. For example, in the causal chain analysis focused on the freshwater lens at Bonriki on the atoll of Tarawa in Kiribati, it was seen that governance and awareness were the main policy options and that there were water problems faced by the islanders due to the absence of water legislation and enforcement capacity to safeguard the use of the freshwater lens as their source of water. There is an urgent need for water resources legislation and policies put in place to monitor the use of water being pumped from the lens and the careful disposal of used water so that it does not enter the groundwater system again as recharge. At present, there are no policies in place to reduce water use, or to recycle water, and with increasing awareness of global changes occurring (these atolls being at the forefront of this plight), this has led to more funding being made available for training and preparedness initiatives. There is also a need for adequate water resource management and salinity monitoring of the water levels within the infiltration galleries so that no excessive pumping occurs.

## Implementation

SOPAC has laid the foundation for countries to build upon in their future water management strategies. The steps required for their implementation at the national level will include:

- Consultation with all stakeholders and awareness raising on the importance of sustainable use of water supplies, and a detailed review of the SOPAC regional policy to see where it applies, and where it does not, in the national context. This consultation process should be facilitated by the national and local governments, in cooperation with the private sector.
- Development of appropriate legislation on water (where this does not exist) or modification of existing legislation in order to meet the requirements agreed to in the SOPAC Action Plan. These should provide for appropriate penalties where regulations are contravened. There will be a need for input from Environmental Legal officers in the drafting of legislation.
- Development of necessary strategies for enforcement, and sourcing of the necessary funds required for enforcement, and for upgrading of systems. NGOs as well as government could play a role in this process, and local communities should be involved.

# Unsustainable exploitation of living resources

The call for integrated coastal area planning and management is a recurrent theme in global conventions and agreements to which the majority of Pacific nations are party, and in Action Plans and policy guidelines adopted by regional inter-governmental organisations and NGOs. Traditionally, the ethic of viewing the coastal area and adjacent waters as a whole is embedded in the traditions of all Pacific Island peoples; the concept of the *vanua* (Fiji) or *fenua* (Samoa) has governed traditional use of land and sea for thousands of years and does not separate one from the other. It would seem, then, that the translation of this important tradition into modern planning and management strategies would be a simple process, but this is not so. The hierarchical structure of governments, the sectoral approach even at the regional level (where inter-governmental bodies have specific sectoral mandates), and the largely top-down planning and decision-making process in governments, are all hindrances.

Furthermore, there is a serious lack of the capacity in most countries required to implement integrated planning and management of the coastal area, and a lack of political will to deal with difficult issues that might impede short-term gain in some sectors. Economics drive decisions in the resources and tourism sectors, for example, and issues such as environmental damage, or overexploitation, are sometimes swept aside or given low priority. It is instructive that, in most governments if not all, no position is identified as a Coastal Planner. One reason is that such a job would require a very broad background in many areas, and one rarely provided through existing tertiary educational systems, although this is now changing. The international community has itself had great difficulty in defining what exactly is required of a coastal planner (see Call to Action 1995).

Within the Pacific Islands region very few governments have developed national Integrated Coastal Management Plans. In the absence of such plans, mechanisms for cross-sectoral planning for the coastal area are poorly developed, and may involve many different government departments. As mentioned above, the elements for such planning have been proposed almost *ad infinitum* at the global and regional level. When asking why such plans have not been developed, it has been advised that this process is not attractive to donors (whose help would be needed). In the ocean and coastal sectors, responsibilities fall under many government departments in some Pacific Island countries – for example, 14 different departments are involved in Fiji.

It was agreed in the causal chain analysis that most of the problems relating to unsustainable exploitation of other living resources relate to lack of capacity to enforce regulations, the licensing system, inadequate fisheries data (especially for the subsistence fishery) and a lack of awareness among stakeholders and consumers of the consequences of overexploitation. For Fiji, it was agreed that overpopulation was not the main root cause, rather that the economy, government policies, lack of data and awareness were the most critical.

Recent community level studies have greatly enhanced awareness of the value of self-regulation of the inshore fishery: the International Ocean Institute, in partnership with government, the private sector, and NGOs ran a total of seven awareness-raising workshops throughout Fiji, attended by a more than 750 villagers. Many villages in Fiji are now requesting assistance on how to increase their capabilities in this area. Regulation is hampered, however, by the lack of data on most stocks fished in the subsistence sector, and hence lack of any regulation of the fishery. The Fiji's Locally Managed Marine Area (FLMMA) project referred to earlier (Tawake 2004), is an excellent example of the cooperation of local communities, government and NGOs in the establishment and monitoring of Marine Protected Areas (MPAs). There are 410 gazetted fishing areas (*qoliqoli*) in Fiji, and all of these could self-regulate given the necessary know-how and capacity. The Fisheries Division is unable to meet the demand for assistance because of shortage of staff, so this is being carried by the University of the South Pacific and NGOs, who are also stretched. Community regulated fisheries would enable resource owners to use appropriate social pressures for compliance, but at the moment there is no legal recognition of traditional "law", and this needs to be changed. Furthermore, government priorities in the fishery are driven much more by economics than by any conservation or sustainable ethics.

The fisheries licensing system needs to be reviewed and improved so that more sustainable and integrated management of stocks can be carried out. This would have to go hand-in-hand with the development of a much improved scientific basis for the fishery, focusing on stock estimates that would allow the implementation of realistic size and catch limits on subsistence fisheries. At the same time, there is a need for much greater feedback between government and the stakeholders. Illegal fishing such as the use of explosives, poisons and illegal nets is a significant problem in Fiji, and is poorly enforced because of the lack of human resources and funds in the Fisheries Division.

Aquaculture has serious implications in Fiji and elsewhere in the region. In Fiji, it is largely unregulated and there is no government legislation in place, although the government is bound by various agreements and conventions to which it is signatory, such as CITES. The industry is almost entirely involved with introduced species, such as Tilapia, two species of prawns, grass carp, pearl oysters, seaweeds (*Kappaphycus*) and, most recently, goatfish. Policies need to be put in place for the prevention of alien introductions. The seaweed *Kappaphycus* has now “escaped” from some of the many seaweed farms in Fiji, and is invading coral reefs in Vanua Levu and Viti Levu. The same species has become a serious nuisance in Hawaii, and is heading in that direction in Fiji. More attention should be paid to the potential of local species as candidates for aquaculture.

## Problems faced by existing management regimes

### Centrally-based management

In most Pacific Island countries government agencies responsible for managing coastal fisheries are also responsible for promoting their economic development. The latter cause is often given higher priority, even though it is recognised by most fishing agencies and coastal communities that the catch rates of fish and invertebrates from lagoons and inshore reefs have been declining for a number of years (King & Lambeth 2000). Changes in village lifestyle are bringing economic pressures on fishers to earn more income in order to satisfy higher material aspirations.

Most Pacific Island authorities have adopted the Western models of fisheries management, even though in temperate water countries such policies have repeatedly proved to be expensive and ineffective. These management regimes also require a sophisticated regulatory regime and extensive information on stocks, neither of which are possible given the limited resources and capacities of Pacific Island countries. The highly complex nature of tropical ecosystems places further constraints on implementation and enforcement of western-style fisheries management. There is a lack of understanding of these complex ecosystems, and the long-term impacts of management decisions made in ignorance of these ecosystems. Essentially, Pacific Islands fishery management regimes consist of a proliferation of regulations that government fisheries departments do not have the resources to enforce (Johannes 1994a, b).

### Community-based management

Alternative management regimes for coastal fisheries have been proposed to recognise the traditional role of village communities in the allocation and management of fish stocks. A great deal has been written on this topic, and SPREP has addressed the issue in some detail. Many researchers have extolled the virtues of Customary Marine Tenure (CMT), but others doubt the social equity of CMT regimes, and whether they are effective for fisheries management (Anderson et al. 1999).

Important factors that affect the integrity of CMT, and also impact on governance issues at the national and local level can be identified as:

- **Demography change and urbanisation:** 35 % of Pacific Island people now live and work in towns, and this is expected to increase to 50 % by 2020. Fisheries close to urban centres face the greatest threats and require the most management. Urbanisation has led to a breakdown in community-based management.
- **Modernisation and economic development:** The introduction of new fishing technologies and the increasing incidence of destructive fishing practices have had a major impact on the depletion of coastal fish stocks in the Pacific Islands. Increasing demand for fish in urban centres has led to the exploitation of resources further and further away as traditional fishing stocks become depleted.
- **Equity considerations:** CMT systems are not necessarily egalitarian in nature, and the control of some fishing stocks by a few chiefs has often resulted in inequitable distribution of resources. CMT systems may continue to prevent equitable treatment of participants in fisheries. Competition for cash has contributed to the erosion of traditional principles of reciprocity and redistribution in communities. CMT systems may also reinforce gender inequalities existing in traditional power structures. There is a growing need among communities for increased accountability and transparency in decision-making.
- **Transboundary concerns:** Within coastal systems it is questions whether traditional boundaries represent appropriate fisheries management units. CMT is usually represented by a patchwork of CMT areas along a given coastline, each with different sets of rules and access control. This makes the development of large-scale fisheries difficult.
- **Legal and policy issues:** A significant post-independence issue in most Pacific Island countries is not the fact that few give any formal statutory recognition of authority to CMT, nor are there any national policies that define the role of CMT in national fisheries administration. The possibility of codification of traditional law has been discussed by Fong (1994), although this has not yet happened. In Samoa, village by-laws have a legal status, and

allow village councils to manage marine protected areas with some authority (Fa'asili & King 1997). Efforts to provide a legal foundation for CMT systems and community-based management involve political issues far beyond the restricted field of fisheries legislation. Some fisheries administrators argue that CMT systems hamper the development of modern, efficient, national coastal fisheries. Others argue that the complexity of CMT systems may hamper the systematic and scientific planning and implementation of effective resource management regimes.

## Towards co-management

SPREP suggests that in many areas CMT might eventually benefit by becoming embedded in the framework of co-management, essentially the mutual sharing of management responsibilities between local and national systems. There is a need to identify clear institutional roles for each partner that builds on their respective strengths.

According to Anderson et al. (1999) the respective roles of government and communities would be:

### Government:

- Provide legislative framework;
- Identify sites under potential threat;
- Assist management to plan development;
- Provide technical assistance;
- Conflict resolution;
- Provide training and extension.

### Communities:

- Identify management objectives;
- Implement the management plan;
- Develop mechanisms for effective communication.

### Steps for establishment of co-management regimes

A number of recent examples demonstrate how co-management regimes can be established. One of the most publicised is the Village Fisheries Management Plan project developed in Samoa (Fa'asili & King 1997, King & Fa'asili 1999), and a more recent example from Fiji was the Locally Managed Marine Areas (LMMA) project, internationally recognised through the award of a Millennium Prize during WSSD in Johannesburg in 2002. King & Lambeth (2000) produced a manual for promoting the co-management of subsistence fisheries by Pacific Island communities.

The process adopted in Samoa (King & Fa'asili 1999) took two years to set up in an initial total of 44 villages, and was overseen by fisheries extension staff. As described by King and Fa'asili (1999) communities

undertook to support and enforce government laws banning the use of chemicals and explosives. Traditional destructive fishing methods such as the use of plant-derived fish poisons (ava niukini) and smashing of corals to catch sheltering fish were also banned. Most villages made their own rules to enforce national laws regarding catch and size limits, and some villages introduced controls on the use of nets, torches and spear fishing. Other measures included killing crown-of-thorns starfish, banning the removal of beach sand and dumping of rubbish in lagoons. The majority of the villages (38) elected to establish their own small fish reserves, closed to all fishing. The strongly traditional set-up in Samoan villages greatly facilitated the success of the project, and involved consultation with the village Fono, the holding of various village group meetings (including women's groups) leading to the ultimate development of the Village Fisheries Management Plan and the establishment of a Fisheries Management Committee (King & Fa'asili 1999). An important step was the recognition of village by-laws used for the enforcement of regulations. This programme illustrates the steps required in the establishment of a successful co-management programme in the Pacific. The trigger for the programme in Samoa was substantial funding from AusAID. Aid funds were also critical in the establishment of the LMMA in Fiji. It will be important to see where these programmes will be sustainable once aid funds dry up.

## Policy options

The following policy options need to be developed:

- Promotion of community-based marine resources management of the fisheries with cooperation between the resources owners, custodians, the government, NGOs and the fishing industry; the focus would be on sustainable development of marine resources and integrated coastal management;
- Changes to the current licensing system to improve feed-back between government and all the stakeholders and to encourage and promote sustainable fisheries using both scientific and customary practices;
- Development of appropriate research policies to enhance the gathering of data on inshore stocks, these to be used in the development of size and catch limits for the subsistence fishery;
- Formulation of better waste management strategies together with the implementation of acceptable environmental standards and practices;
- Identification and utilisation of better resource-use methods that are appropriate and cost effective;

- Development of legislation and regulations for the aquaculture and mariculture industries;
- Recognition and formulation of local by-laws that would allow greater monitoring and enforcement of fishery regulations at the community level.

### **Effectiveness of policy options**

The effectiveness or otherwise of the promotion and adoption of community-based management regimes has been summarised above. More and more Pacific Island countries are moving towards adopting a co-management approach, and some innovative solutions have emerged. In Samoa, the Fisheries Act of 1988 was specifically designed to include provisions dealing with procedures whereby a village could declare its own fisheries rules as by-laws. There a strong link between communities and government that has evolved over the past 10 years (King & Fa'asili 1999). In Fiji, a linkage between communities and government has been assisted by a statute that prohibits government fisheries officers from issuing a fishing license to any person who has not already obtained the written permission of the representative of the customary fishing rights area concerned. The Native Lands and Fisheries Commission in Fiji has identified, surveyed and registered over 400 customary fishing rights areas (Waqairatu 1994).

### **Obstacles to policy options**

The effectiveness of any fisheries policies introduced by Pacific Island governments is likely to be hampered by lack of funds, human capacity and knowledge. Co-management programmes will take a long time for communities to absorb and process the information provided by external partners such as government, a regional organisation or an NGO. Many months will be required to facilitate discussions at the community level before any plan can be developed and adopted.

### **Steps towards implementation**

Governments need to develop a new paradigm in coastal fisheries, where some of the revenues are fed back to local communities to assist with co-management. In addition, alternative lifestyles, and extensive awareness-raising programmes need to be implemented, to accommodate for lost income under new management regimes, and to inculcate the necessary community will to actively pursue co-management strategies that will lead to more sustainable use of coastal resources. Political will of national governments will be a further requirement: unfortunately co-management results in fewer revenues for government, and sustainable practices if properly enforced would lead to a reduction in fish catch while stocks are allowed to recoup from many years of overfishing. Governments might, as a result, give only lip service to co-management. Lack of funds and trained human resources

are also major barriers to effective implementation of new policy options. The root causes identified work against successful implementation of co-management. Given the enormity of what is involved, it would be a brave person who would try and indicate the costs of such policies. The benefits are clear (sustainable fisheries, recovery of fish stocks, involvement of all stakeholders in co-management, etc.) but the cost of achieving these could be substantial.

## **Conclusion**

In conclusion, Pacific Island nations should be encouraged to:

1. Develop national Integrated Coastal Management Plans;
2. Establish inter-sectoral planning and decision-making bodies charged with the responsibility of implementing Integrated Coastal Management Plans. These bodies should include all stakeholders as well as government, the private sector and NGOs.
3. Promote the development of co-management of resources, and the established of marine protected areas.