

# Strategies: National policy objectives and activities



## 6.1 General

While a number of environmental issues have been identified as the critical Target Environmental Components (TECs) for NEMS, there are other important issues that have not been nominated although they have considerable adverse effect on the environment. Pollution, for example, could be regarded as a TEC, but it is covered under other TECs such as water resource protection, waste management and deforestation, where associated pollution would affect the environment.

Sectors like tourism and energy could also be considered as TECs because of their vital contribution to the national economy, and potential impact on the environment. However, the energy sector in general is not a critical environmental issue although hydroelectricity generation could affect the protection of water resources and therefore is covered under that TEC. Likewise, in the tourism sector it is the impact of visitors on traditional culture and waste management which could become critical environmental issues, and these are covered under the respective TECs.

The development of human resources is identified as an important TEC, in recognition of the critical human factor in NEMS. Often, the economic value of human capital is not taken into account when assessing the costs and benefits of development programmes. Sustainable economic growth is also identified as an important TEC, with a focus on the economic activities of various sectors affecting sustainable development. For example, renewable sources of energy and eco-tourism are activities in the energy and tourism sectors respec-

tively, which have the potential to contribute to sustainable economic growth.

Hence, there have been no straightforward rules for identifying TECs, but those chosen were considered to be the current most critical issues affecting the local environment and national development. It is most likely that as the country develops, other TECs will become the priority national environmental issues.

This chapter recommends specific objectives and activities for each TEC, based on the provisions of DP7, the national UNCED report and the UNCED Rio Declaration. It is expected that these will form the basis for national policies. For each TEC, the objectives generally aim to achieve and/or promote:

- (1) direct community benefits;
- (2) environmental planning and assessment procedures;
- (3) information and research facilities; and
- (4) greater public awareness.

The suggested lists of activities are neither exhaustive nor arranged in any order of priority or importance. However, they would provide support and guidance during policy formulation so that the critical issues are covered, and there is some consistency in the overall nature of the national policies. The repetition of some activities highlights the close linkages between all TECs, whereby an event occurring in one TEC would also impact on other TECs.

It is likely that other objectives and activities will be considered and included in the final policies when those people directly involved in the various TECs participate in policy preparation.

The outskirts of Apia show an urgent need for environmental planning. On low-lying reclaimed land, housing and industry compete. (photo: Jennie Cary, reproduced courtesy of DLSE)



## 6.2 Management of population dynamics and trends

### Objective 1

*To attain a sustainable national population growth rate*

#### Activities

- Improve community access to health services and facilities.
- Strengthen existing family planning and counselling services.
- Improve the standards of general education, and encourage increased participation for women.
- Expand national economic development activities, and promote more job creation opportunities.
- Expand food production and self-sufficiency through expanded agricultural extension services.
- Upgrade the quality and quantity of potable water supplies, and improve public health conditions.
- Provide financial and other incentives for families of sustainable size.

### Objective 2

*To integrate population issues into effective environmental planning and assessment, in line with public interest and community aspirations*

#### Activities

- Promote public understanding and support for the strengths of, and urgent need for,

environmental planning, and adopt a framework in which it can function.

- Ensure the proper determination of development proposals to minimize adverse impacts on the environment.
- Allocate equitable distribution of social services and recreational facilities between rural and urban centres.
- Improve the design of subdivisions and human settlements, and ensure effective provision of public utilities and infrastructures.
- Improve the design requirements for buildings to reflect the local conditions.
- Establish a central planning agency charged with all aspects of environmental planning, including the social, physical, natural, economic, historic and cultural environment.

### Objective 3

*To expand and promote primary health care and education, through community health care programmes and school curricula*

#### Activities

- Strengthen primary health care programmes through the Health Department.
- Promote health education through the Education Department school curricula.
- Provide adequate skilled staff and appropriate remuneration for community health workers.
- Improve public knowledge and understanding of nutrition, and encourage consumer protection.

#### **Objective 4**

*To improve the collection, analysis and dissemination of demographic information and related planning data*

##### **Activities**

- ◆ Strengthen existing procedures and techniques for collecting demographic and related planning data.
- ◆ Expand databases and other facilities necessary for collection and analysis of demographic and related planning information.
- ◆ Establish the extent and scope of available resources.
- ◆ Develop extension networks to improve the reporting and registration of demographic data.
- ◆ Improve the training of personnel and methods of data collection.
- ◆ Provide easier and greater public access to available data and information.
- ◆ Encourage and support research on appropriate family planning methods, as well as family planning in the context of local traditions and culture.

#### **Objective 5**

*To create public awareness of population dynamics and trends, and the consequences of rapid resource utilisation and degradation*

##### **Activities**

- ◆ Communicate population and related planning issues to the public through both formal and informal means.
- ◆ Inform decision makers and the general public on the impacts of population dynamics and trends on resources and development planning.
- ◆ Utilise print and electronic media to disseminate population and related planning data.
- ◆ Promote community programmes which focus on the linkages between population and resource utilisation.
- ◆ Promote the concept of joint male and female responsibility for family planning.
- ◆ Encourage public debate and open discussion on family size and related issues.

## **6.3 Protection of the quality and supply of fresh water**

#### **Objective 1**

*To increase public access to clean water*

##### **Activities**

- ◆ Approve a national master plan for the development of water resources.
- ◆ Assess the quantity and quality of water resources.
- ◆ Provide proper engineering designs for water supply networks.
- ◆ Introduce sustainable cost recovery systems related to efficiency and equity of services.
- ◆ Encourage the collection of rainwater.
- ◆ Provide incentives to conserve water.

#### **Objective 2**

*To protect the quality and sources of fresh water*

##### **Activities**

- ◆ Establish an independent authority responsible for water resources management.
- ◆ Develop programmes to protect water catchment areas.
- ◆ Designate public reserves/national parks in water catchment areas.
- ◆ Control the extraction of groundwater.
- ◆ Encourage community participation in programmes to protect water catchment areas.
- ◆ Utilise appropriate traditional methods to protect catchment areas and water quality.

#### **Objective 3**

*To integrate the protection of water resources into environmental planning and assessment*

##### **Activities**

- ◆ Undertake Environmental Impact Assessment to determine the effects of development projects on water resources.
- ◆ Establish the integrated impacts of development programmes on water and other resources.
- ◆ Establish criteria for the equitable public supply of fresh water.



Rainwater tanks offer an alternative means of water storage, Manana Island. (photo: A.C. Robinson, reproduced courtesy of DLSE)

- ◆ Develop appropriate design of water supplies for new subdivisions and human settlements.
- ◆ Encourage land use practices that will not adversely affect water resources.
- ◆ Enact legislation to control the pollution of water resources.
- ◆ Provide incentives for sustainable utilisation of water.
- ◆ Set quality standards for water utilisation, and monitor compliance.

**Objective 4**  
To improve knowledge and develop understanding of water resource issues

**Activities**

- ◆ Establish databases to collect, record and analyse water resources information.
- ◆ Improve the compilation of water utilisation data (both surface and ground supplies).
- ◆ Encourage and support research projects on water resources and related topics.
- ◆ Conduct research on water quality, utilisation and conservation.
- ◆ Assess public attitudes on water supply and related services.

**Objective 5**  
To create public awareness of issues related to the sustainable management of water resources

**Activities**

- ◆ Develop community education programmes on the protection of catchment areas, and the conservation of water.
- ◆ Promote public understanding of watershed management programmes.
- ◆ Promote public awareness of the need for water supply systems to operate on a cost-recovery basis.
- ◆ Use existing village organisations for the promotion of water conservation and catchment area protection.
- ◆ Use print and electronic media to disseminate water resource information, and related planning information.

**6.4 Protection of the sea and marine resources**

**Objective 1**  
To increase the harvestable stocks of fish and other marine resources

**Activities**

- ◆ Establish the extent and levels of fish stocks and other marine resources.
- ◆ Approve sustainable limits for fish catches and resource utilisation.
- ◆ Establish sustainable levels of species harvesting.
- ◆ Develop fish farming to supplement natural stocks.

**Objective 2**  
To conserve and protect marine breeding and feeding areas

**Activities**

- ◆ Protect remaining wetlands and mangrove swamp areas.
- ◆ Prevent the pollution of lagoons and coastal areas from domestic and industrial activities.
- ◆ Develop programmes to protect reef and coral formations from natural and human degradation.





Coastal wetlands throughout Western Samoa are threatened by human activity. Here, soap causes excessive algae growth near the washing stone. (photo: Paddy Ryan, reproduced courtesy of MFAT)

- ◆ Control the siltation of lagoons from soil erosion.
- ◆ Develop the sustainable mining of coral sand.
- ◆ Encourage appropriate traditional fishing practices that are compatible with the sustainable development of marine resources.



Fish trap at Valusu Bay, Upolu. Traps with long extensions catch the full run of mullet, leaving none to breed for subsequent years. (photo: Jennie Cary, reproduced courtesy of DLSE)

### Objective 3

To integrate the sustainable development of marine resources into environmental planning and assessment

#### Activities

- ◆ Assess the impacts of development projects on marine environment and resources.
- ◆ Provide planning controls to protect mangrove and wetland areas.
- ◆ Establish pollution limits for the marine environment.
- ◆ Develop legislation to control the pollution and destruction of the marine environment.

### Objective 4

To promote better understanding and improved knowledge of marine resources

#### Activities

- ◆ Establish facilities to collect, analyse and disseminate marine resources information.
- ◆ Conduct studies to strengthen the sustainable management of marine biodiversity.
- ◆ Encourage and support research programmes on marine resources.

### Objective 5

To create public awareness of the need for sustainable development of marine resources

#### Activities

- ◆ Promote public awareness of the need to protect the marine environment.
- ◆ Educate the public about the danger to the marine environment and future harvest.

Figure 6.1 Educational material

# APIA FA'ASAO LO TATOOU GATAIFALE

**O e mafa' i matafaga o Apia**

... (text continues in columns) ...

**Ua faaititia togatogo i Apia...**

**O'aa' mafa' i Apia**

**Ua faaititia i' a i Apia... i le mamata o togatogo ma'aa' i le mamata'**

**Afa' tatou te galulue faatasi, o le a mafa' ona tatou laveaina le gataifale i Apia.**

The understanding of coastal processes and problems is the key to better protection. (reproduced courtesy of Division of Environment and Conservation)

Figure 6.2 Detail, educational poster



through the use of explosives and toxic chemicals as fishing techniques.

- ◆ Promote public understanding of the importance of mangrove swamps to marine life.
- ◆ Develop community programmes to reduce the pollution of coastal waters.

## 6.5 Management of waste

### Objective 1

To prevent pollution from domestic and industrial waste

#### Activities

- ◆ Develop appropriate collection, treatment and sanitary landfills for sustainable disposal of solid waste.
- ◆ Provide incineration facilities for the treatment of some types of special waste.
- ◆ Develop the use of dry-based sewerage

systems and alternative sewage treatment techniques.

- ◆ Prevent pollution of the sea from ocean-sewage outfalls.
- ◆ Provide safe techniques for the storage, treatment and disposal of hospital waste.
- ◆ Prepare and implement a national oil spill contingency plan.
- ◆ Rationalise the classification, storage and handling of toxic chemicals.
- ◆ Establish pollution standards for domestic and industrial waste output.
- ◆ Establish incentives for non-polluting industrial processes and operations.
- ◆ Enact legislation to control pollution levels and monitor compliance with standards.
- ◆ Enact laws to prevent the importation of hazardous waste.
- ◆ Integrate pollution controls with the environmental planning and assessment of development projects.

innovative ways of reducing waste and pollution like the Aegis Oil (Jurnal Ltd) recycling plant near Aple need to be encouraged (from Phobiy Ryan, reproduced courtesy of MFAT)



**Objective 2**  
**To reduce the amount of waste for disposal and treatment**

**Activities**

- ◆ Minimise the generation of waste at source.
- ◆ Maximise the reuse of some types of waste items.
- ◆ Promote the recycling of waste materials.
- ◆ Encourage the development of new resources from some types of waste.
- ◆ Provide incentives to industries for effective utilisation of resources and recycling of waste products.
- ◆ Develop a separation system for solid waste at source.

**Objective 3**  
**To collect, analyse and disseminate information on waste management and related activities**

**Activities**

- ◆ Encourage and support research on waste reduction, recycling and recovery.
- ◆ Provide an integrated database for waste management and planning.
- ◆ Develop sustainable pollution levels for other resources.
- ◆ Collect information on public attitudes to waste management.

- ◆ Develop sustainable techniques for local treatment and disposal of waste.
- ◆ Analyse international developments in waste management.

**Objective 4**  
**To create public awareness of the sustainable and safe management of waste, including toxic chemicals**

**Activities**

- ◆ Encourage community participation in waste management programmes.
- ◆ Develop programmes to inform the public of the need to reduce waste generation.
- ◆ Inform the public of the contamination risks to groundwater and coastal waters from sewage-related waste.
- ◆ Promote educational programmes to increase public understanding of health and other risks related to special waste.
- ◆ Educate the public on the correct handling and storage of toxic chemicals.
- ◆ Promote public programmes on sanitation and public health.
- ◆ Strengthen existing programmes to combat suicide using toxic chemicals.
- ◆ Promote consumer awareness of the need to minimise waste from food and store packaging.
- ◆ Provide assistance to villages to encourage appropriate waste management systems.



## 6.6 Combating deforestation

### Objective 1

To increase community benefits derived from forest resources and related products

#### Activities

- ◆ Approve a master plan for the sustainable development of forest resources.
- ◆ Establish the extent and scope of existing forest resources.
- ◆ Establish sustainable limits to the harvesting of existing native forests.
- ◆ Develop sustainable and profitable levels of plantation forests.
- ◆ Develop tree plantations for local firewood.
- ◆ Maximise the economic value of forest products to end-users.

### Objective 2

To regulate the clearance of trees and forest areas

#### Activities

- ◆ Conserve unique forests and overall forest biodiversity.
- ◆ Promote programmes to prevent soil erosion resulting from uncontrolled forest clearance.
- ◆ Promote the conservation of water catchment areas.
- ◆ Rehabilitate degraded forest areas, and expand tree cover through reforestation.
- ◆ Promote appropriate land use practices for different land areas.

### Objective 3

To integrate the impacts of deforestation into environmental planning and assessment

#### Activities

- ◆ Assess the impacts of development programmes on forest resources.
- ◆ Establish environmental planning criteria related to public open space and green areas.
- ◆ Promote the allocation of appropriate forest areas for national parks and reserves.
- ◆ Enact legislation to allocate forest resources as national assets.
- ◆ Provide legislation to control forest clearance, and monitor soil erosion.
- ◆ Provide incentives for forest conservation on private lands.



The multiple uses of forests need to be appreciated and traditional knowledge retained. Here, an adze is used to hollow out the hull of a traditional outrigger canoe (photo Paddy Ryan, reproduced courtesy of MFAT)

### Objective 4

To develop knowledge and understanding of forest resources

#### Activities

- ◆ Develop facilities to collect, analyse and disseminate information on forest resources.
- ◆ Encourage and support research on the sustainable development of forest resources.
- ◆ Undertake studies on the development of marketable forest products.
- ◆ Develop efficient utilisation of energy from firewood.
- ◆ Promote scientific research on forest species and biodiversity.
- ◆ Develop multi-use development of forest areas.
- ◆ Collate traditional knowledge of forest resources.

The head of the Forestry Division with a group of teachers at their demonstration plot in the Vaisigona wahi catchment area above Apia. (photo: J. Haska, reproduced courtesy of DLSE)



**Objective 5**  
To create public awareness of the need for sustainable management of forest resources

**Activities**

- ◆ Promote educational programmes on the links between forests and other resources.
- ◆ Promote public understanding of the adverse effects of uncontrolled forest clearance.
- ◆ Use traditional organisations and structures to protect forest resources.

**6.7 Development of appropriate land use practices**

**Objective 1**  
To increase output from land utilisation

**Activities**

- ◆ Establish a national land use classification system to guide the sustainable utilisation of land resources.
- ◆ Define various land use zones, and assess their sustainable capabilities.
- ◆ Strengthen agricultural extension services especially in the rural areas.
- ◆ Provide effective support with on- and off-farm planning services to individual farmers.
- ◆ Improve infrastructure and utility services to the rural areas.
- ◆ Improve basic skills in business and financial management.

- ◆ Promote the marketing of local agricultural products.

**Objective 2**  
To integrate appropriate land use practice with environmental planning and assessment

**Activities**

- ◆ Assess the impact of uncontrolled land utilisation and other development projects.
- ◆ Develop appropriate standards for the design of physical infrastructure and land subdivisions.
- ◆ Promote planning control mechanisms to guide land resources utilisation.
- ◆ Review the present land tenure system and develop policies to promote better utilisation of customary lands.
- ◆ Provide financial and other incentives for appropriate utilisation of land resources.
- ◆ Establish a framework for historic and heritage planning.
- ◆ Establish a framework for local economic planning.

**Objective 3**  
To promote research into and knowledge of sustainable utilisation of local land

**Activities**

- ◆ Provide facilities to collect, analyse and disseminate information on land resources utilisation.
- ◆ Encourage and support research on local land use practices.

- ◆ Investigate the merits of some traditional agricultural and other land use practices.
- ◆ Strengthen research programmes in local soil and crop science.
- ◆ Promote research into the development of value-added products from agricultural and primary outputs.

#### **Objective 4**

**To create public awareness of the need for appropriate land use practices**

##### **Activities**

- ◆ Develop community programmes to promote the sustainable development of land resources.
- ◆ Promote community awareness of the linkages between land utilisation and the sustainability of other resources.
- ◆ Promote agricultural education as part of school curricula.
- ◆ Demonstrate the benefits of appropriate utilisation of land resources.
- ◆ Demonstrate the merits of appropriate agricultural methods and techniques.

## **6.8 Conservation of biodiversity**

#### **Objective 1**

**To maximise the potential benefits related to biodiversity**

##### **Activities**

- ◆ Establish the extent and scope of local biodiversity resources.
- ◆ Evaluate the economic potential of known biological and genetic resources.
- ◆ Identify new and potential applications for biological resources.
- ◆ Document the current use of plant and biological resources for medicine and other applications.

#### **Objective 2**

**To protect and conserve biodiversity**

##### **Activities**

- ◆ Protect the natural ecosystems of forests and river environments and preserve typical examples.



The most diverse vegetation community in Western Samoa, rain-forests are now rare in the lowlands. Tiaved, Uluvalu. (photo: A.C. Robinson, reproduced courtesy of DISE)

- ◆ Develop programmes to minimise the destruction and pollution of natural habitat.
- ◆ Develop programmes to rehabilitate degraded habitat.

#### **Objective 3**

**To integrate biodiversity conservation with environmental planning and assessment**

##### **Activities**

- ◆ Assess the effects of development projects and human activities on biodiversity to promote its protection.
- ◆ Develop planning controls to protect and conserve biodiversity.
- ◆ Control and/or prevent the introduction of inappropriate foreign plants and animals.
- ◆ Strengthen the capabilities of agricultural inspection and quarantine services.



Looms will use spurs made from natural fibres, in this instance, a native herb. (Photo: Paddy Ryan, reproduced courtesy of MFAT)

#### **Objective 4**

**To develop knowledge and promote understanding of local biodiversity**

##### **Activities**

- Establish facilities to collect, analyse and disseminate information and data on biodiversity
- Encourage and support research programmes on aspects of local biodiversity
- Undertake scientific research into local biological and genetic samples
- Collect traditional knowledge of biodiversity

#### **Objective 5**

**To create public awareness of the need to conserve biological and genetic resources**

##### **Activities**

- Promote community awareness of the need to conserve and maintain biodiversity
- Develop community programmes to share traditional knowledge of local plants and animals
- Develop public understanding of the integrated connections between biodiversity and other biological resources
- Promote the study of biodiversity through school science curricula

## **6.9 Protection of the atmosphere**

### **Objective 1**

**To support global efforts to improve atmospheric conditions and air quality**

#### **Activities**

- Assess local sources of pollution and how they affect the atmosphere
- Encourage the use of materials and products that do not deplete the atmospheric ozone layer
- Promote the sustainable development of land transport infrastructure
- Conserve forest resources and create tree cover
- Encourage the use of alternative and renewable energy sources
- Review vehicle inspection standards to reduce exhaust emission and improve engine performance

### **Objective 2**

**To integrate the monitoring of atmospheric quality into environmental planning and assessment**

#### **Activities**

- Assess the impacts on the atmosphere of development projects and some domestic activities
- Review current policies on the importation and use of motor vehicles
- Review the cost structures for petroleum products
- Review present production of energy to promote sustainable cost recovery
- Establish pollution limits for atmospheric discharge from domestic and industrial activities
- Provide incentives for non-polluting or less polluting industrial processes and products
- Develop appropriate designs for buildings and towns in response to predicted climatic changes
- Develop procedures to promote the equitable allocation of fresh air and other public goods
- Develop national policies for alternative energy sources





Riuh raurun Beach Road, Apart The Western Sarawak Government can help reduce greenhouse gases produced by vehicle emissions through reviewing inspection standards, policies on the import and use of motor vehicles, and cost structures for petroleum products. (photo: Paddy Ryan, introduced courtesy of MAF)

**Objective 3**  
**To develop understanding of the effects of pollution on atmospheric quality**

**Activities**

- ◆ Establish facilities to collect, analyse and disseminate information on the causes and consequences of pollution in the atmosphere.
- ◆ Provide updated information on global developments in climatic changes and atmospheric pollution.
- ◆ Encourage and support research programmes on pollution controls.
- ◆ Undertake cost/benefit studies into alternative energy supplies and sustainable transportation.
- ◆ Establish the effects of some traditional behaviour (for example, open burning) on the atmosphere.

**Objective 4**  
**To create public awareness of global climatic changes and the need to protect the atmosphere**

**Activities**

- ◆ Develop community programmes to combat atmospheric pollution.
- ◆ Promote public education programmes on the causes and effects of global climatic changes.
- ◆ Promote public support for clean air policies through consumer networks.
- ◆ Encourage public participation in efforts to reduce pollution of the atmosphere.
- ◆ Encourage self-sufficiency in preparation for

the predicted impacts of global climatic changes.

- ◆ Inform the public of global efforts to combat climatic change and atmospheric pollution.

## 6.10 Planning for climate change

**Objective 1**  
**To improve preparedness for the effects of predicted climate change**

**Activities**

- ◆ Assess the likely risks (due to climate change (for example, sea-level rise and tropical cyclones) in the design of long-term projects.
- ◆ Approve appropriate planning standards for coastal and low-lying areas.
- ◆ Develop urban design criteria to minimise the effects of potential sea-level rise and climate change.
- ◆ Develop engineering designs for buildings and physical infrastructures, especially in low-lying areas.
- ◆ Establish appropriate standards for the provision of public services in high-risk areas.
- ◆ Promote self-sufficiency in preparation for expected natural disasters.
- ◆ Assess the likely impacts of sea-level rise on groundwater and marine resources.
- ◆ Determine the social effects of sea-level rise on coastal communities which may have to relocate elsewhere.
- ◆ Adopt appropriate land use practices for low-lying areas.



sea-wall construction by Apia foresters. When natural systems are disturbed, engineering solutions may help protect urban areas from the impact of waves. (from A.E. Nohines, reproduced courtesy of DSLE)



### Objective 2

*To develop knowledge and promote understanding of the predicted impacts of climate change and the greenhouse effect*

#### Activities

- ◆ Provide facilities to collect, analyse and disseminate information on climate change and greenhouse effect.
- ◆ Educate the public on the causes and effects of climate change.
- ◆ Inform the public on current global and regional knowledge on sea-level rise.
- ◆ Monitor local tidal fluctuations and coastal wave actions.
- ◆ Monitor weather patterns and regional wind movements.
- ◆ Promote public awareness of the risks to life and property associated with sea-level rise and tropical cyclones.
- ◆ Prepare guidelines on actions to adopt in response to climate change.

## 6.11 Preservation of traditional arts, culture and history

### Objective 1

*To strengthen the sense of Samoan identity through the preservation of traditional arts, culture and history.*

#### Activities

- ◆ Approve a national policy on traditional arts and culture.

- ◆ Establish a national museum for the preservation of traditional artefacts.
- ◆ Develop national archive facilities to manage historic documents and Samoan history.
- ◆ Establish a national cultural centre to promote the teaching and practice of traditional arts and crafts.
- ◆ Develop national facilities for the performance of traditional songs and dances.
- ◆ Improve the provision of national library services.
- ◆ Encourage the teaching of Samoan culture in schools and local universities.
- ◆ Encourage the participation of NGOs and village organisations in programmes to promote the preservation of Samoan culture.

### Objective 2

*To integrate the preservation of traditional arts, culture and history with environmental planning and assessment*

#### Activities

- ◆ Assess through Environmental Impact Assessment (EIA) the impact of development projects on traditional organisations and values.
- ◆ Provide incentives and controls to preserve historic monuments and sites.
- ◆ Establish procedures for heritage planning.
- ◆ Encourage the use of traditional architecture in the design of public buildings and village shelters.



The new 'fale' at Samoa College, Apia, replaces the previous 'fale' destroyed by Cyclone Val. Built in traditional style, synthetic twine replaces the coconut sennet. (photo: A.C. Robinson, reproduced courtesy of DLSE)

**Objective 3**  
**To promote knowledge and understanding of traditional arts, culture and history**

**Activities**

- ◆ Support studies on the development of local arts and crafts.
- ◆ Support research on Samoan history and early development.
- ◆ Develop skills in Samoan language and oratory.
- ◆ Develop appropriate resources for the teaching of the Samoan language in schools.
- ◆ Develop local designs in less traditional products such as textiles and other export products.
- ◆ Develop traditional skills in Samoan architecture.

**Objective 4**  
**To improve community awareness of traditional arts, culture and history**

**Activities**

- ◆ Strengthen traditional family and village organizations.
- ◆ Promote the use of traditional foods and drinks.
- ◆ Encourage the teaching of reading and writing in the Samoan language.
- ◆ Promote the practice of traditional songs and dances.
- ◆ Promote the use of traditional buildings.
- ◆ Encourage the use of traditional fishing techniques.

## 6.12 Development of human resources

**Objective 1**  
**To improve the management of human resources to meet community expectations and aspirations**

**Activities**

- ◆ Approve a national policy for the effective development and use of human resources.
- ◆ Strengthen the role of workers and their organisations in sustainable development.
- ◆ Strengthen the role of business and industries in sustainable development.
- ◆ Strengthen the role of NGOs as partners in sustainable development.
- ◆ Provide appropriate worker remuneration linked to efficiency and productivity.
- ◆ Provide adequate rewards for skills upgrading.
- ◆ Improve the returns to labour in the primary sector.
- ◆ Promote worker participation in management functions and decision making.

**Objective 2**  
**To integrate human resource planning needs with overall environmental planning and assessment**

**Activities**

- ◆ Assess the current and future staffing needs of all sectors at the national level and in the public service.

- ♦ Integrate human resource needs with general education and skills training programmes.
- ♦ Improve accountability in development and social programmes.
- ♦ Establish a tripartite structure to manage industrial relations.
- ♦ Improve working conditions and occupational safety.
- ♦ Increase investment in skills and staff training.

#### **Objective 3**

**To improve knowledge and understanding of human resource development**

##### **Activities**

- ♦ Establish facilities to collect, analyse and disseminate human resources information.
- ♦ Undertake research on relevant local human resources development issues.
- ♦ Provide options to minimise the loss of local qualified workers to overseas countries.
- ♦ Develop rationalisation of the public service, with more clearly defined career paths, strengthened management and appropriate incentives.
- ♦ Assess the nature and scope of 'human capital'.

#### **Objective 4**

**To make the public aware of the requirements of human resource development**

##### **Activities**

- ♦ Inform the public through schools and vocational institutions of available opportunities for human resource development.
- ♦ Explain to parents the career opportunities that are available to their children in the local labour market.
- ♦ Promote the effectiveness and relevance of education at all levels, both academic and vocational.
- ♦ Introduce vocational and career planning programmes for school students.
- ♦ Promote adult education to improve skills for those already in the workforce.
- ♦ Prevent the 'brain drain' to overseas labour markets.

## **6.13 Promoting sustainable economic growth**

#### **Objective 1**

**To improve the local standard of living through sustainable economic development**

##### **Activities**

- ♦ Approve a national policy aimed at sustainable economic growth.
- ♦ Create a good mix of employment opportunities.
- ♦ Develop resource-based industries using local products.
- ♦ Attract foreign investment to appropriate industries.
- ♦ Encourage local entrepreneurial activities by providing incentives for such individual and/or joint ventures.
- ♦ Consolidate the efficient use of existing infrastructure.
- ♦ Revitalise the primary sector including the traditional system of agriculture and traditional crops.
- ♦ Encourage the harvesting of new cash crops with higher cash returns, for example, vanilla, lime, chilli, ginger.
- ♦ Develop new commercial and community forest plantations.
- ♦ Develop the fisheries sector to meet domestic consumption and increased export of high-value stocks.
- ♦ Promote wide community use of renewable energy sources.
- ♦ Develop eco-tourism and other sustainable activities in the tourism sector.

#### **Objective 2**

**To integrate economic development with overall environmental planning and assessment**

##### **Activities**

- ♦ Establish the procedures for local economic development.
- ♦ Establish the framework for urban and regional planning.
- ♦ Create the appropriate environment for the creation of sustainable employment.
- ♦ Provide incentives for industries to practise clean industrial processes that do not harm the environment.



Eco-tourism, like this 'paupou' ride through the mangroves of Saanapu/Saanao, offers an alternative or supplementary income to communities that conserve their natural areas. (photo A.C. Robinson, reproduced courtesy of DLSE)

- ◆ Set control standards for pollution and other public 'nuisance'.
- ◆ Establish a framework for proper determination of development projects, including the use of EIA.
- ◆ Improve the procedures for monitoring of economic development programmes.
- ◆ Establish the procedures for evaluation and review of economic development programmes.
- ◆ Develop incentives for industries that meet sustainable development criteria to locate in Western Samoa.
- ◆ Improve the accountability of public officials and the reporting of publicly funded programmes.
- ◆ Improve the provision of public services based on social equity and appropriate cost recovery.

#### **Objective 3**

**To develop knowledge and understanding of options for sustainable economic development**

##### **Activities**

- ◆ Provide facilities to collect, analyse and disseminate economic data.
- ◆ Undertake an environmental audit to determine the actual basis for sustainable development.
- ◆ Develop appropriate indicators to monitor local economic performance.

- ◆ Assess the merits of setting up an agency for science and technology to coordinate the research and development of new products and services.
- ◆ Undertake research on appropriate ways to achieve sustainable growth.
- ◆ Update understanding on the status of the rural subsistence sector.
- ◆ Develop long-term markets for local products and services.

#### **Objective 4**

**To increase public participation in economic planning and development**

##### **Activities**

- ◆ Promote community participation in national and local economic planning.
- ◆ Encourage inputs from the business and labour sectors in the formulation of economic policies.
- ◆ Encourage the involvement of NGOs and grassroots organisations in economic planning and development.
- ◆ Develop educational programmes on economic development at schools and at the community and village levels.
- ◆ Communicate to the public the provisions of national policies and directions for economic development.



## Implementation structures

### 7.1 Policy formulation

With Cabinet approval of the National Environment and Development Management Strategies, the second phase dealing with policy formulation and preparation will begin. Policy Committees are to be established for the TECs, consisting of representatives from the relevant departments or agencies.

Each Policy Committee will appoint its own officers, and will establish a work plan to guide its activities. The secretarial work may be carried out by the department or agency with the most direct involvement in the TEC. Other costs may be shared by the organisations concerned as necessary. It is most important that officers involved in the Policy Committees are sufficiently senior so that decisions can be made without the need to refer back to their organisations.

Table 7.1 shows the core organisations that are expected to be involved in the Policy Committees. Other agencies or individuals may be included as necessary to provide wide representation. The activities of the Policy Committees will have been completed when Cabinet approves the final policies.

The most important aspect of policy formulation is to seek and promote wide community input and participation in the determination of proposed issues and content. It is expected that during the various stages of policy formulation an ongoing programme of public education and awareness be conducted through the press, radio, seminars or other traditional means, so that the community is kept informed of the policy proposals. Final Cabinet approval will also be speedier if widespread public consultation and support is evident.



Detail, new 'fala' at Samoa College, Apia (photo/A.C. Robinson, reproduced courtesy of TSLSE)



Table 7.1 NEMS Policy Committees

TEC	Agencies
Population	Health Department; Education Department; Department of Statistics; Department of Lands, Surveys and Environment; Treasury Department; Ministry of Women Affairs; Family Health Association; National Council of Women; Women's Development Committee
Water	Western Samoa Water Authority; Health Department; Department of Agriculture, Forests and Fisheries; Department of Lands, Surveys and Environment; Education Department; Treasury Department; Puleunu Council; Consumer representatives; Electric Power Corporation
Marine resources	Department of Agriculture, Forests and Fisheries; Department of Lands, Surveys and Environment; Treasury Department; Puleunu Council; O le Siosiomaga Society; Faasao Savali Society; National University of Samoa; University of the South Pacific; Fishing industry representatives
Waste management	Department of Lands, Surveys and Environment; Health Department; Public Works Department; Department of Trade, Commerce and Industry; Treasury Department; Western Samoa Visitors Bureau; Disposal contractor representatives
Deforestation	Department of Agriculture, Forests and Fisheries; Department of Lands, Surveys and Environment; Puleunu Council; O le Siosiomaga Society; Faasao Savali Society; Landowner representatives
Land use	Department of Agriculture, Forests and Fisheries; Department of Lands, Surveys and Environment; Puleunu Council; Agriculture Score; Public Works Department; Treasury Department
Biodiversity	Department of Agriculture, Forests and Fisheries; Department of Lands, Surveys and Environment; O le Siosiomaga Society; Puleunu Council; Faasao Savali Society; National University of Samoa; University of the South Pacific
Atmosphere	Department of Lands, Surveys and Environment; Department of Agriculture, Forests and Fisheries; Ministry of Transport, Police and Prisons Department; Treasury Department; Electric Power Corporation; Public Works Department
Climate change	Department of Agriculture, Forests and Fisheries; Department of Lands, Surveys and Environment; Public Works Department; Ministry of Foreign Affairs
Arts and culture	Department of Youth, Sports and Culture; Ministry of Foreign Affairs; Education Department; National University of Samoa; University of the South Pacific; Western Samoa Visitors Bureau; O Mea Sina (Art) Society; Western Samoa Visitors Association
Human resources	Public Service Commission; Labour Department; Education Department; Treasury Department; Public Service Association; Manufacturers Association; Chamber of Commerce
Economic	Treasury Department; Department of Trade, Commerce and Industry; Ministry of Foreign Affairs; Department of Lands, Surveys and Environment; National University of Samoa; University of the South Pacific; Central Bank of Samoa; Commercial banks

## 7.2 Policy presentation

While there are a number of different ways to present public policies, it is important in the case of NEMS to provide a consistent format for all policies. This will simplify the reading of documents, streamline their overall administration, and ease integration and comparison of policy issues. The format proposed for the national policies to be developed for each TEC is as follows.

- (1) Introduction
- (2) Policy goals
- (3) Objectives and Activities
- (4) Implementation
- (5) Evaluation
- (6) Conclusions
- (7) References
- (8) Attachments

- |                                      |   |
|--------------------------------------|---|
| (1) <b>Introduction</b>              | The policy introduction discusses the current situation related to the TEC in question, and how it integrates with the other TECs. It describes the trends in the TEC up to the present time, and their likely implications for national development. It also identifies areas where information is lacking and remedial action required.   |
| (2) <b>Policy goals</b>              | The policy goals relating to each TEC are directly linked to the overall goals of NEMS, as stated in Section 3.2. The underlying principles on which the policy is based are also discussed, and the merits of particular options for future action are assessed with the preferred option (or options) identified.   |
| (3) <b>Objectives and Activities</b> | In this section, policy goals are stated in terms of operational outcomes or objectives. Chapter 6 gives some of the most important policy objectives, with key activities to achieve those objectives. It is suggested that the policy objectives be arranged in a hierarchy to follow the logic of policy implementation. In this way, the public will find it easier to see how the success of one outcome will follow another, and that a lower order outcome must be achieved first before the next order outcome can be addressed (Wells 1987). |
| (4) <b>Implementation</b>            | Policy implementation and evaluation are discussed in Sections 7.4 and 7.5 respectively.  |
| (5) <b>Evaluation</b>                |   |
| (6) <b>Conclusions</b>               | The conclusions sum up the important policy issues, justification for the policy provisions, and the future consequences of inaction. They also show the costs and benefits to the country with and without the policy, and the winners and losers in both scenarios.   |
| (7) <b>References</b>                | All relevant authorities and references are listed at the end of each policy document. This provides a bibliographic record for the particular TEC, which can be updated periodically, especially during policy evaluation.   |
| (8) <b>Attachments</b>               | Lastly, any other information that the Policy Committee identifies as relevant to the policy is included in the attachments at the end of the policy document.  |

**Table 7.2 NEMS Implementing Agencies**

TEC	Implementing Agency
Population	Department of Lands, Surveys and Environment (Division of Environment and Conservation)
Water	Western Samoa Water Authority
Marine resources	Department of Agriculture, Forests and Fisheries (Fisheries Division)
Deforestation	Department of Agriculture, Forests and Fisheries (Forestry Division)
Waste management	Department of Lands, Surveys and Environment (Division of Environment and Conservation)
Land use	Department of Lands, Surveys and Environment
Biodiversity	Department of Lands, Surveys and Environment (Division of Environment and Conservation)
Atmosphere	Department of Agriculture, Forests and Fisheries (Observatory)
Climate change	Department of Lands, Surveys and Environment (Division of Environment and Conservation)
Arts and culture	Department of Youth, Sports and Culture
Human resources	Education Department
Economic	Treasury Department, Department of Trade, Industry and Commerce

### 7.3 Policy implementation

Prior Cabinet approval is required for the national policies (Phase 2) before policy implementation in Phase 3 can officially proceed. This approval is critical as it will require the various departments and agencies to cooperate in NEMS policy implementation as a priority part of their normal duties and responsibilities. The NEMS policy provisions will also be the focus in the preparation, assessment and implementation of all national development programmes.

The success of NEMS policy implementation will largely depend on the support given by the heads of the departments or agencies concerned, and their commitment of the necessary staff and resources. As NEMS is based on issues and not sectors, the willingness of the various organisations to work together is also of vital importance for successful implementation. With a number of sectors having joint responsibility for each TEC, it would be easy for some to be less committed, and simply hope that others will take charge.

To coordinate the implementation of NEMS national policies, TEC Advisory Committees are to

be established. It is expected that the members of the Policy Committees will form the core of the TEC Advisory Committees which will set their own rules and procedures. The administration of NEMS policy implementation will become the responsibility of the organisation with the greatest involvement in a particular TEC. Table 7.2 shows the recommended Implementing Agencies for the various TECs. The necessary implementation tasks will become part of the normal activities of the Implementing Agencies.

The TEC Advisory Committees, in close consultation with the Implementing Agencies, will approve the Work Plans for policy implementation. These Work Plans will set out priority activities, project details, public education programmes and implementation schedules. They will also provide the mechanisms for various organisations and individuals to interact and/or contribute to policy implementation activities.

### 7.4 Evaluation

Evaluation is an important implementation component. Without independent evaluation of policy

activities, the extent to which objectives have been achieved cannot be properly assessed. It is expected that policies will be evaluated every three years. The evaluation objectives are to be clearly defined and will include (1) an assessment of how the objectives are met, and (2) a review of the adequacy of current policy requirements. The latter would provide recommendations to improve policy implementation and/or existing provisions, and allow the TEC Advisory Committees to propose any necessary changes to Cabinet for approval.

It is important that evaluation be carried out by independent evaluators who have not been involved in policy implementation. This would minimise preconceived perceptions of the outcomes and the likelihood of biased results. The following evaluation components are identified as most useful and should be included in the evaluation plan (Taulealo 1990):

- (1) intended outcomes;
- (2) activities to achieve outcomes;
- (3) factors affecting the achievement of outcomes;
- (4) criteria for success; and
- (5) performance indicators.

The TEC Advisory Committees will approve the evaluation plan to be used, especially the performance indicators, so that the final results would be of maximum benefit to the Committee. The use of qualitative indicators is to be encouraged as these would assess community feelings about the success or otherwise of policy implementation.

## 7.5 Overall coordination

Under the present system, the overall coordination of NEMS activities will come under the Division of Environment and Conservation (DEC) of the Department of Lands, Surveys and Environment, with a NEMS Advisory Committee comprising the chairpersons of all the TEC Advisory Committees. The NEMS Advisory Committee will set its own rules and procedures, but the head of DEC would be in the best position to be its chairperson. The activities of the NEMS Advisory Committee will be a priority part of the normal duties of DEC, and will include regular reporting to Cabinet on the overall progress of NEMS implementation.

In the long term, there is an urgent need to establish a separate government organisation to be responsible for environment and planning matters. This will bring all issues related to environment and development under one authority which should minimise conflicts and delays. The main objective of this new organisation will be the promotion of sustainable development through the management of resources and the control of adverse impacts of development projects on the natural, social, cultural and economic environments. It will employ professional staff from a wide range of disciplines, and existing planning divisions of various departments may have to amalgamate under the proposed organisation. It can also coordinate other environmental services such as waste management, development consent and building approval.

## PART 3

# Programme profiles



At the time of writing (October 1993), the identification and prioritising of activities within the NEMS framework is not yet complete. This will take place during the policy formulation stage (Phase 2). It is this remaining and vital part of the process which will properly determine the NEMS programme profiles.

For the purposes of publication of this document, however, it is necessary to give an indication of the programmes viewed as being the priorities for funding assistance for Western Samoa at this stage of the NEMS process. The profiles that follow are thus not the result of NEMS Phase 2.

In addition, there are projects already being implemented which focus on some of the priority issues identified by NEMS Phase 1. In order to present a picture of the current priorities of the Government of Western Samoa, it is important to note the existence of these projects which provide the immediate context for the profiles which follow.

The principal projects already approved or under way which relate to the priority issues or Target Environmental Components (TECs) identified in NEMS Phase 1 are identified in the following list. Note that only projects which seek to achieve integrated results, or tasks identified in the NEMS Phase 1 document, but which are not purely single-sector targeted, are listed:

- (1) The water catchment restoration and protection component of the Cyclone Damage and Rehabilitation Project (DAFF and DLSE).
- (2) Waste Management Public Awareness Project (DLSE)
- (3) Amendments to environmental legislation, including the provision of an appropriate process of Environmental Impact Assessment (DLSE).
- (4) Western Samoan participation in the SPREP Regional Environmental Awareness Programme (DLSE)
- (5) Apia sewerage project (principal investigations have been completed, but final decisions are yet to be taken by the Government and funding secured) (PWD).
- (6) Rainwater tank project (PWD)
- (6) Conservation and sustainable management of the mangroves and their environs at Saanapu and Saunua (DLSE)
- (7) Protection and sustainable use of the lowland forests of Aopo, Letuli and Sasua (DLSE and Faasao Savali)



- (8) Planning for the protection and sustainable use of the lowland forests and islands of the Aleipata district (DLSE, DAFF and the Ole Siosiomaga Society).
- (9) Re-development of the National Botanic Garden at Vailima (DLSE).
- (10) Bird surveys and management for species of conservation concern (DLSE).
- (11) Establishment of a Biodiversity Database (DLSE).
- (12) Conservation and Management Programme for Sea Turtles in Western Samoa (DLSE and DAFF).

# Detailed programme profiles

## Contents list

<b>Target Environmental Components (TECs)</b>	<b>Programme profiles</b>	
<b>Management of population dynamics and trends</b>	1 Population workshops	66
<b>Protection of the sea and marine resources</b>	2 Palolo Deep Marine Reserve — planning and management	67
<b>Management of waste</b>	3 National Waste Management Strategy	69
	4 Hospital wastes management project	71
	5 Introduction of biogas technology	73
<b>Conservation of biological diversity</b>	6 Ecological survey of mid-slope and upland forests	75
	7 Compilation and publication of a Flora of Samoa	77
<b>Coastal Zone Management*</b>	8 Coastal ecosystems monitoring	79
	9 Integrated coastal zone management project	81
	10 Coastal sand and aggregate resource survey	83
	11 Coral reef / mangrove ecological monitoring	85
<b>Preservation of traditional arts, culture and history</b>	12 Preservation of archaeological sites	87
<b>Promoting sustainable economic growth</b>	13 Sustainable development of handicrafts	90
<b>Institutional strengthening</b>	14 Institutional strengthening for the Division of Environment and Conservation (DEC)	92
<b>Environmental education</b>	15 Environmental awareness survey	95
	16 Video production on the environment	97

**Note** All currency amounts are in United States dollars (\$US).

## Programme Profile 1

### Population workshops

<b>Background</b>	<p>At current growth rates, and assuming that emigration opportunities will continue to decline, Western Samoa's 1986 population of 157,158 could double by the year 2021. The problem is not so much that population is increasing, rather that land and other natural resources as well as existing social and economic infrastructure will not be able to accommodate a higher population at the current level of living standards. The result of raising a population beyond the optimum level is the over-exploitation and degradation of the natural resource base — which is held in this NEMS document to be the case for Western Samoa. Indeed, more of the current environmental problems in Western Samoa have been attributed to overpopulation.</p> <p>On the other hand, there has been little serious effort to integrate population issues into national development planning, or to try to attain a national population growth rate that available resources can sustain. Some effort has been made, principally through the work of the Health Department and the Family Health Association, and the drafting of the population policy has highlighted many pressing issues and concerns. However, a broad-based understanding of population dynamics, an essential element for any successful programme, is still lacking. Thus, there is a need for a more concerted effort to create public awareness of population dynamics and trends and, in particular, their implications for resource utilisation and the level of living standards.</p>				
<b>Aim and scope</b>	To support the conduct of workshops, organised by NGOs (including village groups), to create public awareness of population issues and their relation to the environment and living standards. An important sub-objective is to develop resource materials (printed and visual materials) and resource persons.				
<b>Description</b>	<p>The tasks which will be undertaken under the proposed programme are to:</p> <ul style="list-style-type: none"> <li>(a) identify locally available resource materials and ways of supplementing them;</li> <li>(b) develop terms of reference for subcontracting the organisation and conduct of workshops; and</li> <li>(c) monitor the conduct of workshops and evaluate their effectiveness.</li> </ul>				
<b>Cost estimates</b>	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;">25 workshops at \$1,000 per workshop</td> <td style="text-align: right; width: 20%;">25,000</td> </tr> <tr> <td><b>Total cost</b></td> <td style="text-align: right;"><b>\$US 25,000</b></td> </tr> </table>	25 workshops at \$1,000 per workshop	25,000	<b>Total cost</b>	<b>\$US 25,000</b>
25 workshops at \$1,000 per workshop	25,000				
<b>Total cost</b>	<b>\$US 25,000</b>				
<b>Executing agency</b>	The Family Health Association in close cooperation with the Education Department and the Health Department, other NGOs such as the National Youth Council, O le Siosiomaga Society and Faasao Savaii Society, and the Division of Environment and Conservation.				
<b>In-kind support</b>	The executing agency and the subcontractors will provide counterparts, some materials, and administrative/logistics support.				
<b>Duration</b>	1 year				

## Programme Profile 2

### Palolo Deep Marine Reserve — planning and management

#### Background

The Palolo Deep Marine Reserve, adjacent to the town of Apia, is a popular place for both Samoans and overseas tourists. Over 3,000 visitors a year take the opportunity to snorkel over 'the deep', enjoying the variety of marine life and resting in the 'fales' on the land portion of the reserve.

Palolo Deep is a hole in the lagoon, protected behind the fringing reef and so supporting a luxuriant growth of corals and thousands of associated plants and animals. The reserve was established in 1979, one of the first marine reserves created by a South Pacific nation. Despite its long history, there had not, until recently, been a survey of the area to determine what lives there and the range of marine habitats that are conserved. Neither has there been a formal management plan to guide its development. Work is now well in hand for the development of such a plan.

In early April 1993, following a successful week of training in the use of scuba for selected Division of Environment and Conservation (DEC) staff, a consultancy was let to carry out a biological survey of the reserve, establish boundary markers, and set up and sample permanently marked biological monitoring sites.

DEC has received the consultancy report on this biological survey and the information is being incorporated into the reserve management plan. The next stage after the completion of the plan is to implement three main areas: capital works, preparation of an information display, and re-sampling of the biological monitoring sites.

#### Aim and scope

To carry out a biological survey of the Palolo Deep Marine Reserve leading to the development of a management plan for the reserve and, ultimately, to the implementation of the plan's recommendations.

#### Description

The programme will be carried out in two phases.

##### Phase 1

April–December 1993

- (a) DEC and a consultant carry out a biological survey of the Palolo Deep Marine Reserve; and
- (b) DEC prepares a management plan.

##### Phase 2

January 1994 —

DEC and a consultant redevelop the reserve infrastructure following the recommendations in the management plan.

#### Cost estimates

Scuba training, biological survey, management plan production	37,700
Equipment for reserve management	4,500
Implementation of management plan	42,000
<b>Total cost</b>	<b>\$US 84,200</b>

#### Executing agency

Division of Environment and Conservation in close collaboration with the Fisheries Division of the Department of Agriculture, Forests and Fisheries and the Western Samoa Visitors Bureau.

***In-kind support***

The Division of Environment and Conservation will provide scientific, technical and management staff to assist the survey, development of the plan, and its implementation.

***Duration***

1 year  
(Up to October 1993, the scuba training and the field work for the survey had been completed.)



## Programme Profile 3

### National Waste Management Strategy

#### Background

As Western Samoa's material culture changes, and as more and more use is made of non-biodegradable and often toxic materials, there is a growing need to change the public perception of waste. No longer can waste be perceived as something that is thrown away and disappears. The problem with modern (non-biodegradable) waste is that, rather than disappearing, it has a lasting effect on the environment.

Although little is known about the amount of solid waste being generated nationwide, it is estimated that approximately 17,000 cubic m or 3,000 t of waste were disposed of annually at the former disposal site at Vaiusu Bay. All rainfall runoff from the site still discharges directly into the bay, and with no control on leachate or the types of waste disposed of there, this run-off poses serious threats to the marine environment and to the health of consumers of seafood from the adjoining bay and lagoon areas. A new landfill site further inland has now replaced the Vaiusu Bay site, with a large area of land allocated for waste disposal and recycling. Optimum design and operation of the new disposal site awaits the completion of the Waste Management Strategy.

The disposal of sewage is also a growing problem. With no public sewerage system in the country, private homes are served by a variety (in type and in standards) of on-site systems. In low-lying areas of Apia, groundwater is being polluted by effluent from septic tanks and latrines. In densely populated areas elsewhere, especially where percolation rates are high, polluted groundwater is resulting in the contamination of near-shore areas. There is also growing public concern about the use and disposal of chemicals and agricultural pesticides, and their effects on water quality and the marine environment.

The nature of modern waste and the limited land space in Western Samoa means that attention must also be given to reducing the supply of certain wastes. This may be by incentives and/or regulation through quota systems, pricing policies etc., or even by prohibition. Some new or amending legislation may be needed in order to ratify certain international conventions such as the Montreal Convention concerned with limiting damaging disposal of certain substances.

The basis of any strategy is the collection of adequate data. Certain data have already been collected, and some collection is ongoing. A waste streams data collection project is now largely completed thanks to the funding of projects by SPREP, and it is envisaged that the data and experience from this project will be utilised in developing the Waste Management Strategy.

At present, the urgent priorities for waste management are being met under the Division of Environment and Conservation's Rubbish Action Plan. This Plan is designed to be as compatible as possible with the eventual Waste Management Strategy (WMS). It should provide impetus and direction for the Waste Management Strategy to build upon, particularly by way of its associated public awareness campaign and work with the private sector.

Waste management is a critical and complex issue in Western Samoa.

	<p>and it is therefore essential that all aspects of the problem and its solution are addressed in an integrated way. This requires the coordination of actions by individuals, government, the private sector and communities in a range of activities from import control and legislative amendment to waste minimisation, separation, recycling, collection and appropriate disposal on a daily basis. The proposed National Waste Management Strategy will provide the blueprint for an appropriate programme of action.</p>														
<b>Aim and scope</b>	<p>To prepare and assist in initiating the implementation of a National Waste Management Strategy (NWMS).</p>														
<b>Description</b>	<p>The steps which will be followed in implementing the proposed programme are to:</p> <ol style="list-style-type: none"> <li>appoint a project manager (and any assistants needed) for six months;</li> <li>assess data/information collected through the waste streams data collection project, the Rubbish Action Plan and any other projects of government or NGOs, and incorporate them into the NWMS;</li> <li>assist DEC in setting up a coordinating committee for implementation of the Waste Management Strategy;</li> <li>prepare and initiate implementation of a public education campaign as a parallel component of the Waste Management Strategy in close cooperation with the Environmental Training Officer;</li> <li>initiate the process of achieving government approval for the Waste Management Strategy and support for its implementation; and</li> <li>initiate the process of implementation for the NWMS.</li> </ol>														
<b>Cost estimates</b>	<table border="1"> <tr> <td>Personnel</td> <td></td> </tr> <tr> <td>    Project manager—6 months</td> <td>35,000</td> </tr> <tr> <td>    Assistants</td> <td>5,000</td> </tr> <tr> <td>Transport and communications</td> <td>5,000</td> </tr> <tr> <td>Training</td> <td>5,000</td> </tr> <tr> <td>Miscellaneous</td> <td>5,000</td> </tr> <tr> <td><b>Total cost</b></td> <td><b>\$US 55,000</b></td> </tr> </table>	Personnel		Project manager—6 months	35,000	Assistants	5,000	Transport and communications	5,000	Training	5,000	Miscellaneous	5,000	<b>Total cost</b>	<b>\$US 55,000</b>
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<b>Total cost</b>	<b>\$US 55,000</b>														
<b>Executing agency</b>	<p>Division of Environment and Conservation. Important collaborating agencies include the Ministry of Women Affairs, Health Department, Education Department, Public Works Department, Ministry of Transport, Electric Power Corporation, and NGOs such as the National Youth Council, O le Siosiomaga Society and Faasao Savaii Society.</p>														
<b>In-kind support</b>	<p>The Division of Environment and Conservation will provide administrative support, counterpart staff, assistance with logistics etc.</p>														
<b>Duration</b>	<p>6 months</p>														

## Programme Profile 4

### Hospital wastes management project

#### Background

Inappropriate waste management at the national hospital as well as at district hospitals is a severe problem. Sharps (needles, scalpel blades etc.), contaminated dressings, operating theatre wastes, used or expired drugs, sewage and general waste are generally inadequately disposed of, and often in ways which present considerable health risk to both hospital workers and members of the general public in the vicinity.

No system of sterilisable containers for the separate collection and transportation of these solid wastes exists in any of the hospitals, neither is there an adequate level of appreciation of the hazards involved in the incorrect disposal of these wastes. Sharps etc. are frequently disposed of down drains, sinks and toilets, into the general rubbish, or even out of windows. At the national hospital the incinerator which used to burn contaminated wastes is no longer functional, and the district hospitals have no incineration capacity at all.

The national hospital's newly commissioned sewage treatment system is not functioning properly, due to a lack of appropriate maintenance, which in turn is apparently due to a lack of adequate staff training. The plant would seem to require some relatively minor but nonetheless significant modifications in order to provide for its satisfactory ongoing operation.

The problem is partly due to a lack of adequate maintenance and administrative capacity (particularly in the case of solid waste management) and partly due to a lack of adequate staff training.

#### Aim and scope

The project has four components:

- (a) To provide an appropriate system of sterilisable containers for ward collection of separated wastes, and sealed containers for the transportation of these accumulated wastes to the final disposal site.
- (b) To provide adequate disposal facilities for contaminated flammable and inflammable hospital wastes.
- (c) Training for national hospital sewerage plant maintenance staff and upgrading of the plant (provision of replacement diffuser diaphragms, a sludge dry bed, a replacement disinfection system for the present non-functioning UV system).
- (d) A training programme for nurses and general hospital staff in the appropriate management of wastes, based on the new container and disposal systems provided by the project. Materials associated with the training would also be provided, from teaching materials to signs and posters.

#### Description

The above section outlines the project's components. The waste containers aspect is straightforward, once the appropriate products and numbers have been identified. Hospital staff training is also relatively straightforward, involving insertions into regular nurse training and in-service refresher courses, as well as the provision of posters, signage etc.

The wastewater treatment plant training is different in that it has two components. The first is training in day-to-day maintenance involving practical, hands-on involvement with the plant itself, based on an

	<p>(Understanding of the process and operation of the plant. The second is training on longer term, infrequent maintenance such as the removal, drying and disposal of sludge. This second component also requires the provision of some basic facilities such as a sludge drying bed. Aspects of both dictate training that is spread over a reasonable period, necessitating an initial visit and a minimum of two follow-up visits by the trainer. (This is considered to be the most effective in general training terms.)</p>										
<p><b>Cost estimates</b></p>	<table border="1"> <tr> <td>Provision of collection containers</td> <td>quotes awaited</td> </tr> <tr> <td>Provision of incineration/burial facilities (approx.)</td> <td>9,000</td> </tr> <tr> <td>Wastewater plant training</td> <td>8,000</td> </tr> <tr> <td>Staff training</td> <td>3,200</td> </tr> <tr> <td colspan="2"><b>Total cost</b></td> </tr> </table>	Provision of collection containers	quotes awaited	Provision of incineration/burial facilities (approx.)	9,000	Wastewater plant training	8,000	Staff training	3,200	<b>Total cost</b>	
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<b>Total cost</b>											
<p><b>Executing agency</b></p>	<p>Jointly by the Department of Lands, Surveys and Environment and the Health Department.</p>										
<p><b>In-kind support</b></p>	<p>The Government of Western Samoa will provide local counterparts, office space and logistics support. Some minor local budget contributions (for example, maintenance budget for wastewater plant, construction of incineration compounds using materials provided by the project) will be possible.</p>										
<p><b>Duration</b></p>	<p>Training should occur over a three-month period rather than a short immersion course. Ideally, this would involve an initial training session and two or more follow-up sessions. In the case of the wastewater treatment plant, such training would focus on key activities such as sludge removal and drying, which only happen periodically.</p>										

## Programme Profile 5

### Introduction of biogas technology

#### Background

Liquid effluent containing high biological nutrient loading, uncontaminated by chemical or other wastes, is a major source of environmental degradation in Western Samoa.

Three distinct sources of such pollution exist at three different scales. There is a village level source of liquid nutrient pollution from pigs and poorly designed and maintained toilets; an urban source in Apia from principally domestic, but also commercial, sources as well as subsistence activities such as family pig rearing; and an industrial source centred mainly on the Vaitele industrial estate.

All three sources hold good potential for the successful application of biogas technology and warrant the setting up of pilot projects and investigations. Preliminary discussions which have been held jointly between the Australian International Development Assistance Bureau (AIDAB), the Chinese Government and SPREP have proved promising.

#### Aim and scope

To develop an integrated biogas project involving pilot applications in both the rural and urban context, and the establishment of a training course at the Western Samoa Polytech, drawing on Chinese expertise and utilising AIDAB and SPREP funding sources. The project would also undertake investigations into the further development of biogas applications in Samoa including the Vaitele industrial estate and the government rubbish dump at Tafaigata, as well as the further expansion of the village/family level applications.

#### Description

The proposal would see the contracting of a small group of Chinese consultants to:

- oversee the construction of the small-scale pilot projects;
- train the people involved in running the pilot projects;
- establish and run a short course for the Western Samoa Polytech as well as a training course for trainers; and
- carry out feasibility studies on the further application of biogas technology including a system/systems for the Vaitele industrial estate, the Tafaigata rubbish dump and the Apia urban area.

Funding for the Chinese mission may be sought from SPREP. Funding for materials may be sought from AIDAB.

#### Cost estimates

Consultants (three, six months each)	75,000
Consultants travel and accommodation costs	30,000
Training materials and costs	10,000
Construction materials	5,000
<b>Total cost</b>	<b>SUS 120,000</b>

#### Executing agency

Department of Lands, Surveys and Environment, Western Samoa Polytech.



***In-kind support***

The Department of Lands, Surveys and Environment will provide logistics and administrative support from its own budget. The Western Samoa Polytech will supply office space and general support to the preparation and carrying out of training programmes.

***Duration***

Six months

## Programme Profile 6

### Ecological survey of mid-slope and upland forests

<p><b>Background</b></p>	<p>Many of the terrestrial surveys undertaken between 1974 and 1991 were sketchy in nature, their main aims being to identify sites for protection. The most recent and comprehensive one was done in 1991, focusing on the lowland forests and identifying fourteen key sites to represent the biological diversity of this habitat. These surveys and other works have provided an adequate information base on birds, reptiles, mammals, flowering plants and ferns, particularly in the lowlands. The key gaps in knowledge are in the uplands, the preferred habitats of many species of native plants and animals. Increasingly, the uplands have also become the last refuge of several endangered species such as the tooth-billed pigeon (<i>Didunculus strigirostris</i>). The upland forests suffered severe damage from the two recent cyclones, and there is also increasing pressure to exploit these areas for logging and agriculture. There is therefore an urgent need for a survey to identify key upland areas for protection, as the first step towards the conservation of upland forests and the sustainable utilisation of resources therein.</p>
<p><b>Aim and scope</b></p>	<p>To conduct an ecological survey of the mid-slope and upland forest areas in Western Samoa with a view to identifying key sites of sufficient size whose subsequent protection will conserve the full range of ecosystems of those habitats and ensure the long-term survival of their species and genetic biodiversity.</p>
<p><b>Description</b></p> <p><b>Phase 1</b></p> <p><b>Phase 2</b></p>	<p>The programme will be in two phases.</p> <p><b>6 months</b></p> <p>(a) The Division of Environment and Conservation (DEC) will plan the approximate areas to be covered in the full survey;</p> <p>(b) a pilot survey will be undertaken including</p> <ol style="list-style-type: none"> <li>(i) an aerial reconnaissance of both islands to identify possible access points; and</li> <li>(ii) an on-foot survey of the uplands of O Le Pupu-Pue National Park on Upolu to determine ground area expected to be covered in a given time and to refine techniques for sampling different taxonomic groups; and</li> </ol> <p>(c) the conducting of an awareness programme in, and negotiations with, villages to secure their support and possible participation in the full survey.</p> <p><b>2 months</b></p> <p>The consultants and DEC will conduct the full survey adopting a similar approach/methodology to the lowland forest survey of 1991. This used a number of criteria additional to standard ecological surveys including the threats to the ecosystems in question, the presence of threatened species, and the practicality of protecting the area. The precise techniques to be used will be determined in the pilot phase.</p>

<p><b>Cost estimates</b></p>	<p>Consultants</p> <table border="0"> <tr> <td>    Botanist—75 days</td> <td>15,000</td> </tr> <tr> <td>    Entomologist—65 days</td> <td>13,600</td> </tr> <tr> <td>    Airtfares and per diem</td> <td>22,000</td> </tr> <tr> <td>    Travel and allowances—survey team</td> <td>2,500</td> </tr> <tr> <td>    Customary fees</td> <td>2,500</td> </tr> <tr> <td>    Equipment—GIS global finder, traps, lens, jars, fluids etc.</td> <td>3,050</td> </tr> <tr> <td>    Helicopter hire—13 hrs at \$400 per hr</td> <td>5,200</td> </tr> <tr> <td>    Printing</td> <td>1,000</td> </tr> <tr> <td>    Contingencies</td> <td>3,000</td> </tr> <tr> <td><b>Total cost</b></td> <td><b>SUS 67,850</b></td> </tr> </table>	Botanist—75 days	15,000	Entomologist—65 days	13,600	Airtfares and per diem	22,000	Travel and allowances—survey team	2,500	Customary fees	2,500	Equipment—GIS global finder, traps, lens, jars, fluids etc.	3,050	Helicopter hire—13 hrs at \$400 per hr	5,200	Printing	1,000	Contingencies	3,000	<b>Total cost</b>	<b>SUS 67,850</b>
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<b>Total cost</b>	<b>SUS 67,850</b>																				
<p><b>Executing agency</b></p>	<p>Division of Environment and Conservation. Collaborators include the Survey Section of the Department of Lands, Surveys and Environment, the Forestry Division of the Department of Agriculture, Forests and Fisheries, NGOs and communities.</p>																				
<p><b>In-kind support</b></p>	<p>The Division of Environment and Conservation will provide up to six staff members, office space, some logistics support, and some materials to assist with the survey.</p>																				
<p><b>Duration</b></p>	<p>9 months (Phase I has already been funded to SUS 8,840.)</p>																				

## Programme Profile 7

### Compilation and publication of a Flora of Samoa

#### Background

Although there are now known to be over 800 species of flowering plants and 200 species of ferns on the islands of Western and American Samoa, and it is thought that between 30 per cent and 50 per cent are endemic to the archipelago, there is at present no published up-to-date list and no modern Flora available. Among other things, the Flora being proposed here would document the relationship of Samoan plant species with those elsewhere in the region so that investigations of possible medicinal uses can be made to focus on species, genera and families known from work done elsewhere to be pharmacologically active. The Flora would also clearly indicate the distribution and abundance of each species to enable conservation managers to conserve this valuable Samoan resource properly. Existing published works on some components of the flora contain many errors and are taxonomically outdated.

Dr Arthur Whistler has worked on the plant ecology of the Samoan Islands for 20 years and over this period has made 40 separate trips to study the flora. He is now the undisputed expert on the flora of this group. His many publications have utilised his accumulating knowledge of the flora and he would be now in a position to undertake the preparation of a high quality modern Flora.

A necessary prerequisite for the preparation of the most complete flora possible will be the completion of the proposed upland survey (see Programme Profile 6) as these habitats, particularly on Savaii, are still little known floristically. The taxonomy developed from this flora project will be progressively incorporated into the Western Samoa Biodiversity Database.

The proposed Flora will cover the islands of both Western and American Samoa because of their close biogeographic affinities.

#### Aim and scope

To publish a modern Flora of Samoa.

#### Description

The tasks which will constitute the proposed programme are to:

- (a) use floristic data collected through the upland survey (see Programme Profile 6) to add to existing knowledge of the flora of Samoa;
- (b) progressively prepare a text of a Flora of Samoa together with appropriate illustrative material;
- (c) progressively incorporate the taxonomy established for the Flora into the Western Samoa Biodiversity Database; and
- (d) use materials in database to publish a Flora of Samoa.

A grant will be given to prepare a Flora of Samoa. The grant will include three trips to Samoa to collect additional specimen material and one trip to selected European herbaria to examine material collected in the nineteenth century. Work in Samoa will be in close association with biologists in the Department of Lands, Surveys and Environment (DLSE) in Western Samoa and the Department of Marine and Wildlife Resources in American Samoa.

<b>Cost estimates</b>	(figures to be determined) Personnel Expert—2 years over 4-year period Database consultant—1 month Travel and per diem Clerical and technical assistant Subcontract Line drawings Material/equipment Computers compatible with DEC Biodiversity Database Printing 1000 copies of Flora
<b>Executing agency</b>	Division of Environment and Conservation in Western Samoa and the Department of Marine and Wildlife Resources in American Samoa.
<b>In-kind support</b>	The executing agencies in Western and American Samoa will provide in-country liaison and staff for all field trips. The Resource Management Officer in the Division of Environment and Conservation and his/her counterpart in American Samoa will continue to collect plant specimens and send them to the expert consultant as required. These agencies will also provide necessary photographs, office space and support in Samoa.
<b>Duration</b>	4 years



## Programme Profile 8

### Coastal ecosystems monitoring

<p><b>Background</b></p>	<p>Pollution of lagoons is now considered a serious problem, and one which is evident in the poor state of the lagoons near Apia. As well, Fisheries Division statistics consistently show rapid, sometimes dramatic, declines in fish landings. The dramatic decline in the lagoon fishery over recent years has been attributed in large part to land based sources of pollution. Given the extent to which Samoans, who are primarily coastal dwellers, depend on the sea, it is of utmost importance that the lagoons are not subjected to even greater degradation than at present.</p> <p>The Division of Environment and Conservation (DEC) has the legislative mandate to "prevent, control and correct pollution". In fulfilling this mandate, DEC is initiating a number of programmes including the Rubbish Action Plan, and the drafting of a National Waste Management Strategy (NWMS). Some work has been started (for example, the relocation of the Vaiusu Bay disposal site further inland, and the auditing of stream pollution and waste).</p> <p>The programme proposed here will provide information on coastal/lagoon pollution which is crucial to the development of the National Waste Management Strategy; indeed, without this programme, it will not be possible to fill a major gap in the information base necessary to develop such a strategy. This programme is also intended to complement other initiatives by the Government of Western Samoa, namely the conservation and sustainable development of one of the most significant mangrove areas in Western Samoa, Saanapu-Sataoa, and the monitoring of the effects of climate change on key coastal ecosystems (Programme Profile 11).</p>
<p><b>Aim and scope</b></p>	<p>To establish and maintain a monitoring programme to collect information on and devise measures to control coastal pollution. A key sub-objective is to ensure that a local capacity is developed to undertake the necessary tasks beyond the life of the programme.</p>
<p><b>Description</b></p>	<p>The tasks which will be undertaken under the proposed programme are to:</p> <ul style="list-style-type: none"> <li>(a) collate existing information on coastal pollution;</li> <li>(b) establish a sampling programme which is broad but at the same time meets the specific requirements of the National Waste Management Strategy;</li> <li>(c) ascertain in-country capacity to monitor/analyse water quality samples for specified pollutants, and define the needs to be met through the programme;</li> <li>(d) plan comprehensive systems of monitoring and analysis and put them in place;</li> <li>(e) carry out in-country training; and</li> <li>(f) make recommendations for further actions to strengthen national capacity.</li> </ul>

<b>Cost estimates</b>	Consultancy—3 months (fees, travel and per diem)	30,000
	Equipment	10,000
	Overseas sample analysis	5,000
	Training	5,000
	Communications	1,000
	Contingencies	3,000
	<b>Total cost</b>	<b>\$US 54,000</b>
<b>Executing agency</b>	Jointly executed by the Observatory and the Fisheries Division of the Department of Agriculture, Forests and Fisheries and the Division of Environment and Conservation.	
<b>In-kind support</b>	The executing agencies will provide counterparts, administrative and logistics support.	
<b>Duration</b>	3 months	

## Programme Profile 9

### Integrated coastal zone management project

#### Background

Integrated coastal zone management (ICZM) is concerned primarily with the resources of the coastal margins, from lowlands to lagoons. However, for key aspects such as quality of freshwater inputs, ICZM extends to the top of catchments, and for issues such as fish management, it extends past the reefs out to sea. The coastal zone is an area of great complexity and very significant ecological and economic values, and it is characterised by a susceptibility to disturbance through uncontrolled human activity. Coastal areas, both at sea and on land, thus tend to become a focus for the impacts of unsustainable human activities.

Clearly, Samoan society has traditionally relied heavily on coastal resources. Modern Samoan society also has a dependence on these resources, but due to a variety of human pressures, most are degraded to a degree that limits the returns that would otherwise be expected.

Coastal resources are influenced by activities and events which take place not only on the edge of the land and in the lagoons, but also well inland and out to sea. Management of human activities to conserve coastal resources must therefore be able to deal with a wide variety of actions and actors, from the mountain sides to the reefs.

NEMS has recognised the interconnectedness of most terrestrial activities and coastal resources, in that coastal components are included in all TECs. Integrated coastal management broadly equates to sustainable development of islands, and is essentially the approach underlying the Saanapu-Sataoa mangrove project under the South Pacific Biodiversity Conservation Programme.

The Division of Environment and Conservation (DEC) strategy for village projects is also basically one of integrated coastal management, especially in terms of the "reef to mountains" emphasis in village resource management. In Western Samoa, however, there is a difficulty in achieving an integrated approach along the coastline, in that there has been little previous experience or mechanisms developed to assist in integrating the affairs of adjacent villages.

These issues have significantly shaped the particular emphasis of this project. In the context of legislative amendments which would provide enabling provisions for such novel arrangements, the project seeks both to establish national guidelines and to implement village-based projects. This would be a model for district-wide projects involving adjacent groups of villages.

#### Aim and scope

The aims of the programme are to:

- (a) establish ICZM principles in government planning and project development;
- (b) prepare national guidelines for ICZM;
- (c) identify key coastal areas where either significant environmental problems, conservation values, sustainable development opportunities, or climate change/sea-level rise vulnerability require ICZM;
- (d) identify information shortfalls and needs; and

<p><b>Description</b></p>	<p>(e) prepare public information materials and programmes on the nature of and need for ICZM, as well as some practical applications and examples.</p> <p>The project involves the recruitment of a short-term consultant, preferably local, to manage a programme which establishes ICZM principles in government and identifies priority areas for the initiation of ICZM projects.</p> <p>The first task for the local consultant is the preparation of national guidelines for ICZM. This would focus on a consultative process, working with DEC, other government agencies and village representatives through individual village visits and workshops, to establish an appropriate way of carrying out ICZM in the Western Samoan context. This task would link with the first task of the SPREP Integrated Coastal Zone Management in the Pacific Islands Region programme which seeks to characterise appropriate regional mechanisms for the introduction of ICZM. It would draw on experience gained at the Saanapu-Sataoa village project (which is itself essentially an ICZM project) as well as the Aleipata ICZM project and the SPREP/Japanese ICZM (Assessment of Coastal Vulnerability and Resilience to Sea-level Rise and Climate Change) project.</p> <p>The second task would be the preparation of a report to the government recommending measures necessary to introduce ICZM principles into government planning and project development. Measures may include possible structural changes as well as policy and guideline development requirements. The report would also identify information shortfalls and needs, and priority areas for the introduction of local ICZM projects.</p>																
<p><b>Cost estimates</b></p>	<table border="1"> <tr> <td>Local consultant—6 months</td> <td>10,000</td> </tr> <tr> <td>Guideline development process</td> <td></td> </tr> <tr> <td>    Information materials</td> <td>2,000</td> </tr> <tr> <td>    Custom fees</td> <td>400</td> </tr> <tr> <td>    Workshops (3)</td> <td>2,000</td> </tr> <tr> <td>Materials</td> <td>1,000</td> </tr> <tr> <td>Travel</td> <td>750</td> </tr> <tr> <td><b>Total cost</b></td> <td><b>SUS 16,150</b></td> </tr> </table>	Local consultant—6 months	10,000	Guideline development process		Information materials	2,000	Custom fees	400	Workshops (3)	2,000	Materials	1,000	Travel	750	<b>Total cost</b>	<b>SUS 16,150</b>
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<b>Total cost</b>	<b>SUS 16,150</b>																
<p><b>Executing agency</b></p>	<p>Division of Environment and Conservation and the Department of Lands, Surveys and Environment. Important collaborating agencies include the Fisheries Division, Agriculture Division and the Observatory of the Department of Agriculture, Forests and Fisheries; the Public Works Department; and the Ministry of Women Affairs.</p>																
<p><b>In-kind support</b></p>	<p>The Department of Lands, Surveys and Environment will provide local counterparts, office space, logistics support and some financial support from its own budget. It will afford a high priority to assisting the development of the national guidelines.</p>																
<p><b>Duration</b></p>	<p>Six months</p>																

## Programme Profile 10

### Coastal sand and aggregate resource survey

<p><b>Background</b></p>	<p>Coastal erosion is a prominent general feature of Western Samoa's coastline. Coinciding with this is the widespread practice of removing beach sands and coral materials for a variety of construction purposes. The mining of beaches occurs on a large scale in the case of industrial and commercial demand adjacent to Apia, and in conjunction with the upgrading of coastal roading. It occurs on a small scale with the removal by individuals and villages by wheelbarrow and pick-up truck loads. In some cases the continuous small-scale removal of beach sand may cumulatively involve significant volumes.</p> <p>The management of beach sand mining is a matter of concern for integrated coastal zone management, particularly given the desirability of maintaining maximum natural resilience of beaches and coastal sediment systems in order to provide a buffer against storm wave attack and possible sea-level rise.</p> <p>Longstanding law designed to govern this activity has not been complied with or enforced. The Division of Environment and Conservation (DEC) of the Department of Lands, Surveys and Environment (DLSE) has been given a new mandate to manage coasts including sand extraction. Currently, the Public Works Department (PWD) licenses mining under an earlier mandate and generally liaises with DLSE.</p> <p>The principal obstacle to proper management of both marine sand and coastal aggregate mining is the lack of resource information. Licensing of marine sand mining cannot serve any useful purpose without knowledge of volumes, sources, pathways and mechanisms within the natural sand system operating in the area concerned. Maintenance of the newly rebuilt coastal roading network and its associated shore protection works cannot occur without knowledge of and access to suitable local sources of aggregates.</p>
<p><b>Aim and scope</b></p>	<p>The project is designed to follow up on a recently completed assessment of demand for marine sands carried out by Observatory staff, and an analysis of recent coastal aerial photography by the South Pacific Applied Geoscience Commission (SOPAC). It seeks via SOPAC to enlist the services of appropriately qualified consultants to assess the characteristics and gain quantitative data on key parameters of sand budgets in lagoons adjacent to those areas of high commercial/industrial demand. This expertise should also be able to recommend optimal locations and volumes of marine sediments able to be mined on a sustainable basis from these systems.</p> <p>The coastal aggregates survey is designed to provide information on the location of sources of appropriate aggregates for road and shore protection works. It seeks the services of appropriately qualified geological and engineering consultants via SOPAC.</p>
<p><b>Description</b></p>	<p>The project is in two parts, each likely to require different expertise. The first is focused on lagoon sand budget assessment. It will require a data survey phase involving aerial photography and previous field reports, a fieldwork phase, an analysis and report-writing phase, and a</p>



	<p>report-back/seminar phase. Counterparting with local staff from DLSE, PWD and the Observatory will be sought throughout all phases.</p> <p>The second part of the project is the assessment of coastal aggregate resources. This will require liaising with PWD engineers to ascertain the nature and volumes of materials sought to support the coastal roading maintenance programme and its contingencies. It will also require analysis of existing data, fieldwork, analysis and report preparation, and reporting back.</p>
<b>Cost estimates</b>	Quotes are awaited from SOPAC on the resource and time requirements of such a project.
<b>Executing agency</b>	The executing agency for the first part will be the Department of Lands, Surveys and Environment, but with the close involvement of both the Public Works Department and the Observatory. The executing agency for the second part will be the Public Works Department.
<b>In-kind support</b>	The Government of Western Samoa will provide local counterparts, office space and logistics support.
<b>Duration</b>	Awaiting results from recent reports referred to above (Aim and scope).

## Programme Profile 11

### Coral reef / mangrove ecological monitoring

<p><b>Background</b></p>	<p>Scientific advice on global climate change is that there are likely to be potentially severe implications for tropical coastal zones, especially coral reefs and mangroves, which are critical components of Western Samoa's coastal zone. As a small country, Western Samoa cannot do much to influence global developments, relying on collective actions through the international fora and environment treaties. On the other hand, Western Samoa can do much to prepare for possible sea-level rise by continually assessing the effects of climate change on the coastal ecosystems, and by preparing and implementing appropriate management plans.</p> <p>SPREP is developing a regional programme to enhance the capacity of participating countries to monitor and plan for climate change in the Pacific, and Western Samoa's requirements could be met under such a programme. The programme proposed here could be linked to two current projects — the conservation and sustainable development of one of the most significant mangrove areas in Western Samoa, Saanapu-Sataoa, and a coastal ecosystem pollution monitoring project (see Programme Profile 8).</p> <p>The latter could also be combined with the programme proposed here and implemented as a discrete programme rather than as part of a regional climate change monitoring programme. Data from the integration of these programmes (Programme Profile 8 and Programme Profile 11) would be invaluable in designing the management plans for the Saanapu-Sataoa mangroves area.</p>
<p><b>Aim and scope</b></p>	<p>To monitor the effects of climate change on critical reef and mangrove ecosystems in order to:</p> <ul style="list-style-type: none"> <li>(a) assist in the preparation of appropriate responses;</li> <li>(b) compare the effects of climate change with those of other localised pressures as well as other regional localities; and</li> <li>(c) provide base information for assessing the effectiveness of mitigative programmes.</li> </ul>
<p><b>Description</b></p>	<p>This proposed programme is expected to be part of the regional programmes or:</p> <ul style="list-style-type: none"> <li>(a) monitoring and distributing information regarding climate change/sea-level rise; and</li> <li>(b) development of management plans for the critical habitats along the coast and in the lagoon/reefs.</li> </ul>
<p><b>Cost estimates</b></p>	<p>This will depend on what the regional programmes coordinated by SPREP can provide.</p>
<p><b>Executing agency</b></p>	<p>The Observatory and the Fisheries Division of the Department of Agriculture, Forests and Fisheries in close collaboration with the Division of Environment and Conservation.</p>

***In-kind support***

The executing agencies will provide counterparts, administrative and logistics support.

***Duration***

Ongoing

## Programme Profile 12

### Preservation of archaeological sites

#### Background

Several archaeological surveys of Western Samoa have been conducted (in the 1960s and 1970s), revealing the existence of fascinating ancient field monuments and artefacts scattered throughout the islands. The preservation of these sites is important not only because they contain an important aspect of Samoan history and, therefore, Samoan identity, but also because they serve to heighten people's perception of the environment. Furthermore, if they are restored and maintained properly, they could provide pleasure and enrichment for visitors and some income for the trustees and caretakers, be they government agency, NGO, community/village or a family.

Some ancient village settlements, pathways, walls, mounds, star mounds, forts, terraces, oven pits etc., have been documented and mapped. Unfortunately, public awareness and knowledge of and accessibility to these sites is limited. As well, the maintenance and preservation of these monuments has been virtually non-existent to date.

Many of the known sites are intact and within close proximity of modern road networks and/or villages. With some effort, they could be restored, maintained and made accessible to residents and visitors interested in ancient Samoan culture.

A proposal for an archaeological and historic site survey was submitted for funding in 1992 but was deferred pending the outcome of research and field visits being conducted for the production of a new tourist map. The survey work for the tourist map has been completed and a number of significant archaeological and historical sites have been identified. This programme concentrates on the restoration and preservation of five of the outstanding archaeological sites:

- (a) Pulemele ancient mound at Letolo plantation, Palauli, Savaii — regarded as the largest ancient human made structure in the Pacific and remarkable for its imposing size (60 m by 51 m at its base and 12 m high). The mound rises in two tiers, is clear of heavy vegetation though covered in grasses and ferns, and is accessible via four-wheel drive track (1.5 km from main road) through the Letolo plantation.
- (b) Star mound on Manono Island — a unique 12-pointed 'star mound' (star mounds are numerous and are not only impressive in size and shape but mysterious in their origins), located on the highest point of Manono island. The Manono mound is unique because it is constructed on top of a large rectangular mound. Accessibility is via a walking track from Lepurai village. Today, the mound is densely covered in vegetation.
- (c) Mount Olo archaeological site at Mulifanua in Upolu — located on the WSTEC plantation at Mulifanua, and significant because it offers extensive traces of an inland prehistoric settlement of the period AD 500–1800, and gives an insight into living conditions and social systems of ancient Samoa. Recognisable house platforms, roadways, star mounds, mounds, oven pits etc. are numerous, easily accessible and closely grouped. The Western Samoa Tourism Development Plan (1992–2001) suggests that the WSTEC plantation could be developed as

	<p>an archaeological park with educational trails and explanatory signboards.</p> <p>(d) Saleaula village—Mt Matavanu lava flow—this lava field is one of the priority areas for conservation identified by the 1991 national ecological survey. Apart from its natural beauty, there are a number of important historical sites in the vicinity (the virgin's grave and the 18th century church were left 'intact' by the otherwise all encompassing and destructive lava flows of the 1920s) which, if restored and properly maintained, would constitute interesting points for tourists and local people.</p> <p>(e) Tufutafoe village—Falealupo—another of the priority conservation areas identified by the 1991 national ecological survey. This site was severely damaged by the last two cyclones and some assistance is needed to restore it to its pre-cyclone status when it was one of the more interesting points to visit. In the past the village committee which maintained the place adhered to some conservation principles, and it is intended that assistance for the restoration of the site will include training programmes in conservation.</p>
<p><b>Aim and scope</b></p>	<p>To restore and preserve selected archaeological sites as part of the Samoan heritage, and to promote them as tourist attractions while developing a strategy for ensuring the appropriate management and ongoing maintenance of the selected sites.</p>
<p><b>Description</b></p>	<p>A short-term consultant will be engaged to coordinate the restoration work that needs to be done on the sites and to advise on the management, promotion and ongoing maintenance of the sites. The consultant should be an archaeologist or a person experienced in this kind of historical preservation work. An understanding of Samoan culture and/or previous experience in natural resource management would be a decided advantage.</p> <p>The consultant will be able to draw on expertise in resource management, tourism operations and Samoan history and culture available from the Western Samoa Visitors Bureau (WSVB) and the Department of Lands, Surveys and Environment. The WSVB will manage the project and supervise the work of the consultant. Tasks which will be undertaken are to:</p> <ul style="list-style-type: none"><li>(a) visit each site and discuss management options with the relevant people in government and villages;</li><li>(b) identify a particular person as the manager/caretaker for each site and write up their duty specifications;</li><li>(c) write a management plan for each site that assesses environmental, social and cultural impacts;</li><li>(d) implement appropriate tourist information and promotion services which should include brochures, maps, signs, posters and pamphlets outlining recommended tours and educational trails;</li><li>(e) coordinate and oversee the restoration of each site, including management of local village labour resources and equipment to be used in the clearing of sites.</li></ul>



<b>Cost estimates</b>	Consultancy—fees, travel and per diem	30,000
	Transportation	
	Vehicle hire—4 trips (Upolu, Savaii)	1,440
	Boat hire—2 trips (Manono)	400
	Petrol costs—4 trips at \$50 each	200
	Ferry fares—3 passengers plus car	300
	Accommodation plus meals for local residents	
	3 people—6 trips of 3 nights each (\$50 per person per night)	2,700
	Customs fees	1,000
	Site development	
	Materials for signs—15 at \$50 each	750
	Manufacture/erection of signs—15 at \$50 each	750
	Equipment for clearance and restoration	2,500
	Labour—local villages	1,500
	Marketing/promotion	
Production/distribution of promotional brochures, pamphlets and posters	5,000	
	<b>Total cost</b>	<b>\$US 46,540</b>
<b>Executing agency</b>	Western Samoa Visitors Bureau. The Division of Environment and Conservation will collaborate closely.	
<b>In-kind support</b>	The Western Samoa Visitors Bureau will provide local counterparts with local knowledge, office space and logistics support while the Division of Environment and Conservation will provide technical assistance for conservation matters.	
<b>Duration</b>	2 years	

## Programme Profile 13

### Sustainable development of handicrafts

#### Background

A key issue in Western Samoa and the Pacific generally is the dilemma faced by government and private resource owners when confronted with the need to conserve resources. In the past, Samoans were able to live sustainably on local resources. But this was at a relatively low standard of well-being, a standard which they no longer find adequate. Samoans today desire the convenience and the higher degree of well-being offered by modern technologies, and this often requires cash. The Samoan way of life, including its duties and obligations, is increasingly monetised with the consequence that a premium is put on cash.

It is in this context that conservationists are now trying to understand and address the need for greater sustainability in the use of resources. Indeed, there is now an increasing appreciation by conservationists of the need to promote conservation and sustainable use of resources by firstly addressing the need of landowners for an acceptable means of livelihood. Thus, emphasis is being given to sustainable income-generating activities as a means of supporting conservation programmes.

The sustainable development of handicrafts is seen as one of the best ways of addressing the development needs of Samoan resource owners and of reducing the pressure/temptation to deplete the resource base (land and sea) for short-term gains. Such a programme could promote appropriate land use practices in the growing and protection of raw materials. It will also help promote pride in the Samoan culture and traditions. This is very important, especially given the poor quality of Samoan handicrafts at present.

The Faasao Savaii Society is currently involved in efforts to promote income-generating activities in Savaii and has already made informal surveys of the interest of communities around Savaii, and of potential buyers overseas. While the results have been encouraging, there is a need to carry out a more formal survey or study to confirm market interest, the type of handicrafts to be developed, and the level of sustainability in terms of both the ecological carrying capacity and the ability of producers to meet production targets.

#### Aim and scope

The immediate objective of this project is to determine the feasibility of developing a sustainable handicraft industry in Savaii. The long-term objective is to encourage the development of handicrafts as a viable income-generating activity and as an option for those resource owners who would otherwise be exploiting and depleting their resource base for immediate cash/development benefits. The other long-term objective is to encourage more sustainable land use practices and preserve culture and traditions.

#### Description

The project will require the service of a short-term consultant to carry out the feasibility study and prepare recommendations. The terms of reference will be drawn up by the Faasao Savaii Society in consultation with the Western Samoa Visitors Bureau and the Division of Environment and Conservation.

<b>Cost estimates</b>	<table> <tr> <td>Consultancy—fees, travel and per diem</td> <td>30,000</td> </tr> <tr> <td>Operational expenses</td> <td></td> </tr> <tr> <td>    Transport, report writing, customs fees etc.</td> <td>5,000</td> </tr> <tr> <td><b>Total cost</b></td> <td><b>\$US 35,000</b></td> </tr> </table>	Consultancy—fees, travel and per diem	30,000	Operational expenses		Transport, report writing, customs fees etc.	5,000	<b>Total cost</b>	<b>\$US 35,000</b>
Consultancy—fees, travel and per diem	30,000								
Operational expenses									
Transport, report writing, customs fees etc.	5,000								
<b>Total cost</b>	<b>\$US 35,000</b>								
<b>Executing agency</b>	The Division of Environment and Conservation will coordinate the project in collaboration with the Faasao Savali Society and the Western Samoa Visitors Bureau.								
<b>In-kind support</b>	The Faasao Savali Society will provide a local counterpart to facilitate village surveys as well as some logistical support.								
<b>Duration</b>	3 months								

## Programme Profile 14

### **Institutional strengthening for the Division of Environment and Conservation (DEC)**

#### **Background**

Since the establishment of the Education and Training Unit within the Division of Environment and Conservation (DEC), it has been successful in initiating and continuing activities such as weekly radio programmes, tri-weekly newspaper columns, the production and use of educative materials, and the provision of resource persons for workshops and seminars. It has also successfully obtained grants for educational programmes and materials. The Unit, however, continues to operate with only one permanent staff member and an Australian Volunteer Abroad (AVA) expert whose contract expires in September 1994. In 1994-95 the government will increase the number of permanent positions in the Unit to two. As a result of recently received grants for environmental education projects and other campaigns, and the additional work arising from the NEMS-related publicity campaigns, the Unit needs to continue the AVA contract position to temporarily support the increased workload. To cater for NEMS-related work and other programmes, the Unit also requires an upgrading of its desktop publishing capability in addition to some assistance with design and production of materials.

Western Samoa has just begun to broadcast on its own television station and one of the priorities identified is the environment. Already, environmental programmes feature prominently on its nightly transmission, and it is expected that DEC will be one of the agencies providing the technical knowledge. As part of this capacity building programme, it is proposed that training in interview/answer and other presentation techniques appropriate for the television media be made available to the staff of DEC and other government departments.

The conservation of biodiversity is one of the priorities under NEMS, which, together with the opportunities provided under the South Pacific Biodiversity Conservation Programme (SPBCP), means a dramatic increase in the responsibilities of DEC. The biodiversity staff at DEC consists of two local staff, an expatriate chief technical adviser and an Australian Volunteer Abroad (AVA) expert, both of whom have expertise in terrestrial systems.

For the next two years there will be a focus on terrestrial biodiversity. In 1994-95 the government will increase the number of permanent positions in the unit by one. Because of the relative inexperience of local recruits, the Division will have to continue to rely on external technical assistance if it is to carry out its work effectively. Thus, there is a need to continue the AVA contract position in biological survey, which expires in September 1994.

While the current biodiversity programme will continue to concentrate on terrestrial systems for the next two years, the conservation of marine and freshwater systems is equally important. DEC is also responsible for the management of the only marine reserve in Western Samoa. There is thus a need for technical capacity in marine systems which have not been as well surveyed as the terrestrial systems. Therefore, the request also includes funds to recruit a marine biologist.

Environmental planning is another priority area under NEMS. Western Samoa's Environmental Impact Assessment (EIA) legislation is expected to be approved by mid-1994. EIA is a major requirement under NEMS, and some assistance is available under SPREP's EIA programme. However, the requirements of and demand for EIAs will be such that a much more concerted effort is required to train staff from DEC and other government departments in assessment procedures. It is expected that there will be a number of major government projects for which Environmental Impact Statements (EIS) will need to be prepared. An example is the proposed expansion of the Salelologa wharf and township. This work, and any other project which requires an EIA to be prepared in the near future, will need the service of outside experts to conduct EIAs and prepare EISs as there is no local capacity at the moment.

### Aim and scope

To strengthen the capacity of the Division of Environment and Conservation in the areas of environmental awareness/education, biodiversity conservation (terrestrial and marine), and environmental planning.

### Description

The programme will be divided into four tasks:

- to recruit long-term experts in (i) education and information (1995 and 1996), (ii) biological survey (1995 and 1996) and (iii) marine biology (1994 and 1995). The first two positions may be filled by AVA experts while the third may require an expatriate chief technical adviser (CTA). The other component of the first task will be to recruit short-term consultants in (i) visual media (1 week) and (ii) environment planning/EIA (4 weeks);
- the consultants to conduct training for DEC staff and other departments or NGOs;
- to upgrade DEC's desktop publishing capability; and
- to provide assistance in the production of educational pamphlets, posters, billboards etc.

### Cost estimates

Technical experts	
Education and information (AVA expert—2 years)	20,000
Biological survey (AVA expert—2 years)	20,000
Marine biologist (CTA—2 years)	60,000
Consultants—25 days at \$200 per day	5,000
Training	
Visual media	1,000
Environmental planning	4,000
Equipment	
Upgraded desktop publishing system	3,000
Subcontracts	
Design and production of awareness/education materials	2,000
<b>Total cost</b>	<b>\$US 117,000</b>

### Executing agency

Division of Environment and Conservation, Department of Lands, Surveys and Environment.



***In-kind support***

The Department of Lands, Surveys and Environment will provide local counterparts, office space, logistics support and some financial support from its own budget.

***Duration***

2 years

## Programme Profile 15

### Environmental awareness survey

<b>Background</b>	<p>To devise and deliver successful educational programmes (such as the population workshops being proposed under Programme Profile 1) requires some knowledge of the level of understanding of environmental issues by target audiences, and their likely support for efforts to address them. Knowledge of the situation prior to an intervention programme also provides baseline information against which the success of such a programme could be assessed. Currently, the Division of Environment and Conservation (DEC) and other government departments (Education; Agriculture, Forests and Fisheries; Health) and NGOs are involved in environmental educational programmes with varying degrees of knowledge regarding the level of environmental awareness and appreciation among the target groups. This proposal therefore seeks assistance for the design and conduct of a pilot survey to determine the level of understanding and appreciation of environmental issues among Samoans.</p>																
<b>Aim and scope</b>	<p>To design, conduct and analyse the results of a survey aimed at determining the level of environmental awareness and appreciation among Samoans. A sub-objective is to enhance the capacity of local counterparts in the design, conduct and analysis of surveys.</p>																
<b>Description</b>	<p>The programme will involve the following tasks:</p> <ul style="list-style-type: none"> <li>(a) the Division of Environment and Conservation and the Department of Statistics (DOS) will collate existing information on environmental awareness in Western Samoa and send the information to the consultant who will design the survey;</li> <li>(b) the consultant will design the survey and, when in-country, will train local staff on design of questionnaires, collection of responses, and analysis of results;</li> <li>(c) DOS, DEC and other collaborators will conduct a pilot phase of the survey and analyse results;</li> <li>(d) DOS, DEC and other collaborators will conduct the full survey; and</li> <li>(e) with the assistance of the consultant, the executing agencies will analyse the results of the survey and make recommendations for action.</li> </ul>																
<b>Cost estimates</b>	<table border="0"> <tr> <td>Consultant—14 days at \$200 per day</td> <td style="text-align: right;">2,800</td> </tr> <tr> <td>Travel and per diem</td> <td style="text-align: right;">2,400</td> </tr> <tr> <td>Training</td> <td style="text-align: right;">1,500</td> </tr> <tr> <td>Printing of questionnaires</td> <td style="text-align: right;">500</td> </tr> <tr> <td>Field survey</td> <td style="text-align: right;">1,000</td> </tr> <tr> <td>Travel and allowance (survey team)</td> <td style="text-align: right;">1,500</td> </tr> <tr> <td>Contingencies</td> <td style="text-align: right;">300</td> </tr> <tr> <td><b>Total cost</b></td> <td style="text-align: right;"><b>\$US 10,000</b></td> </tr> </table>	Consultant—14 days at \$200 per day	2,800	Travel and per diem	2,400	Training	1,500	Printing of questionnaires	500	Field survey	1,000	Travel and allowance (survey team)	1,500	Contingencies	300	<b>Total cost</b>	<b>\$US 10,000</b>
Consultant—14 days at \$200 per day	2,800																
Travel and per diem	2,400																
Training	1,500																
Printing of questionnaires	500																
Field survey	1,000																
Travel and allowance (survey team)	1,500																
Contingencies	300																
<b>Total cost</b>	<b>\$US 10,000</b>																

<b>Executing agency</b>	The programme will be jointly executed by the Department of Statistics and the Division of Environment and Conservation, with the Education Department and NGOs such as the National Youth Council as collaborating agencies.
<b>In-kind support</b>	The Department of Statistics and the Division of Environment and Conservation will coordinate the collection of background information, and with the other collaborators will provide local counterparts, logistics support and some materials.
<b>Duration</b>	3 months

## Programme Profile 16

### Video production on the environment

<b>Background</b>	<p>Televise Samoa, the country's own television station, officially opened in May 1993, and the environment has been chosen as one of its main programming areas. Programme Profile 14 includes a request for funds to train the Division of Environment and Conservation (DEC) and other government staff in the use of the visual media. Televise Samoa has already proposed that DEC coordinate, for 1994 and 1995, the production of a series of twelve programmes (of approximately 15 minutes each) on local/national environmental issues and concerns. This programme seeks assistance for the production of a series of twelve 15-minute environmental video programmes.</p>														
<b>Aim and scope</b>	<p>To enable DEC to coordinate the production of a 12-part video series on the environment in Samoa. The aims of the series are to improve public awareness of environmental issues and promote environmentally sound activities. A sub-objective is to provide DEC and other government staff with some training in video production.</p>														
<b>Description</b>	<p>DEC will contract out the production of a pilot series. The results of the pilot phase will be reviewed before the contract for the overall series is issued. The contract for production of the overall series will include training for DEC and other government staff.</p>														
<b>Cost estimates</b>	<table border="1"> <tr> <td colspan="2">Subcontracts</td> </tr> <tr> <td>Pilot production</td> <td>10,000</td> </tr> <tr> <td>Production of 12 15-minute video programmes (\$5000 each)</td> <td>60,000</td> </tr> <tr> <td>Local consultants/guides</td> <td>2,000</td> </tr> <tr> <td>Training</td> <td>1,000</td> </tr> <tr> <td>Internal travel and accommodation</td> <td>10,000</td> </tr> <tr> <td><b>Total cost</b></td> <td><b>SUS 83,000</b></td> </tr> </table>	Subcontracts		Pilot production	10,000	Production of 12 15-minute video programmes (\$5000 each)	60,000	Local consultants/guides	2,000	Training	1,000	Internal travel and accommodation	10,000	<b>Total cost</b>	<b>SUS 83,000</b>
Subcontracts															
Pilot production	10,000														
Production of 12 15-minute video programmes (\$5000 each)	60,000														
Local consultants/guides	2,000														
Training	1,000														
Internal travel and accommodation	10,000														
<b>Total cost</b>	<b>SUS 83,000</b>														
<b>Executing agency</b>	<p>Division of Environment and Conservation. Collaborators will include Televise Samoa and other government departments, and NGOs such as O le Siostomaga Society and Faasazi Savali Society.</p>														
<b>In-kind support</b>	<p>The Division of Environment and Conservation will provide local counterparts, logistics support and subject knowledge and expertise. The NGOs will facilitate filming in rural areas.</p>														
<b>Duration</b>	<p>6 months</p>														

# References



- ANZDEC Limited Consultants. 1990. Land Resources Planning Study: Western Samoa. Final report. Asian Development Bank TA no. 106b/SAM, New Zealand, January.
- Brundt Commission. 1980. *North-South: A Programme for Survival*. Report of the Independent Commission on International Development Issues. Pan Books, London, England.
- Bryant, E. 1991. Sea level and greenhouse. *Australian Planner*, vol. 29, no. 1, March.
- Central Bank of Samoa. 1992. Bulletin. Apia, Western Samoa, December.
- Commonwealth Government Of Australia. 1991. Ecologically sustainable development. Discussion paper. Australian Government Printing Service, Canberra, Australia.
- Dahl, A.L. 1986. Review of the Protected Areas System in Oceania. World Conservation Union (IUCN), Gland, Switzerland and Cambridge, England.
- Department of Agriculture, Forests and Fisheries. 1992. Western Samoa Forest Area Statement. Apia, Western Samoa, April.
- Department of Statistics. 1981. Report of the Census of Population and Housing 1981. Apia, Western Samoa.
- Department of Statistics. 1986. Report of the Census of Population and Housing 1986. Apia, Western Samoa.
- Department of Statistics. 1992. Village Population. Report prepared from the 1991 Census of Population and Housing. Apia, Western Samoa.
- Department of Statistics/Department of Agriculture, Forests and Fisheries. 1990. Report on the 1989 Census of Agriculture Western Samoa. Apia, Western Samoa.
- Fairbairn, Te'o., I.J. 1985. *Island Economies. Studies from the South Pacific*. University of the South Pacific, Suva, Fiji.
- Fairbairn, Te'o., I.J. 1993. *Western Samoa's Census of Agriculture: Major Features and Implications for Development*. Centre for Pacific Studies, University of New South Wales, Sydney, Australia.
- Fiame, N. 1992. The implications of a cultural centre. Keynote address at the Cultural Centre Workshop, Apia, Western Samoa, 24 April.
- Gill, R. J. (1993). The land reptiles of Western Samoa. *Journal of the Royal Society of New Zealand*, vol. 23, pp. 79-80.
- Government of Western Samoa. 1990. Fourth Five Year Development Plan for Western Samoa. Department of Economic Development, Apia, Western Samoa.
- Government of Western Samoa. 1991a. National Report for United Nations Conference on Environment and Development, Western Samoa. Prepared by South Pacific Regional Environment Programme, Noumea, New Caledonia.
- Government of Western Samoa. 1991b. Western Samoa Forestry Policy Review. Draft Forestry Policy Statement. Apia, Western Samoa, October.
- Government of Western Samoa. 1992a. Western Samoa's Seventh Development Plan 1992-1994. National Planning Office, Prime Minister's Department, Apia, Western Samoa, March.
- Government of Western Samoa. 1992b. Population Policy. First draft. Apia, Western Samoa, May.
- Government of Western Samoa. 1992c. Western



- Samoa Tourism Development Plan 1992-2001. Prepared by the Tourism Council of the South Pacific, Apia, Western Samoa, April.
- Government of Western Samoa, 1992d. Water supply and sanitation sector: Strategies and policies. Statement presented to the Doctors' meeting, Apia, Western Samoa, September.
- Government of Western Samoa, 1992e. Apia Sewerage Project Review of Master Plan 1992 Report prepared by GKW Consultants and Associates, Apia, Western Samoa, August.
- Government of Western Samoa, 1993. Western Samoa Forestry Policy Review. Revised draft Forestry Policy Statement. Prepared by the Joint Government of Western Samoa Forestry Division and Geomatics Policy Forestry Review Team, Apia, Western Samoa, April.
- Gratton, F.J.H. 1948. An Introduction to Samoan Customs. Republished by R. McMillan, 1985, Papakura, New Zealand.
- Hardin & Assoc. Pty Ltd. 1989. South Pacific project development facility: Western Samoa. Report prepared for the South Pacific Trade Commission, Sydney, April.
- Jordan, D.S. & Seale, A. 1906. The fishes of Samoa. Bulletin of the Bureau of Fisheries, Washington, DC, USA.
- Kear, D., Camber, D. & Brands, C.D.L. 1979. The Hydrogeology and Water Supply of Western Samoa. New Zealand Department of Scientific and Industrial Research, Wellington, New Zealand.
- Kear, D. & Wood, B.L. 1959. The geology and hydrology of Western Samoa. New Zealand Geological Survey Bulletin, n.s. 63, Wellington, New Zealand.
- Lefrisimo, P. 1992. Samoa's cultural environment. Paper presented at the Cultural Centre Workshop, Apia, Western Samoa, 24 April.
- Marshall, C. 1950. Forestry in Western Samoa. Report for the Government of Western Samoa, Apia, Western Samoa.
- Miles, R., Alam, M., Boyle, J. & Lardner, T. 1992. Employment in Western Samoa: Present and Potential. Draft report on Employment Promotion, Manpower Planning, and Labour Administration in the Pacific, for ILO/UNDP/AIDAB, March.
- Neuh, R. 1987. A Feasibility Study for the Development of a National Museum and Cultural Centre of Western Samoa. A UNESCO consultancy report, March.
- Park, G., Hay, R., Whistler, A., Lowgrove, T. & Ryan, P. 1992. The National Ecological Survey of Western Samoa: The Conservation of Biological Diversity in the Coastal Lowlands of Western Samoa. Report compiled by the Department of Conservation, Wellington, New Zealand.
- Pearsall, S.H. & Whistler, W.A. 1991. Terrestrial Ecosystem Mapping for Western Samoa: Summary, Project Report, and Proposed National Parks and Reserves Plan. Prepared for the Government of Western Samoa by South Pacific Regional Environment Programme, Apia, Western Samoa and the East-West Center, Environment and Policy Institute, Honolulu, Hawaii.
- Pratt, H.D., Bruner, P.L. & Bernet, D.G. 1987. A Field Guide to the Birds of Hawaii and the Tropical Pacific. Princeton University Press, Princeton, New Jersey, USA.
- Proudford, H. 1991. The dangers of environmental fundamentalism. Australian Planner, vol. 29, no. 1, March.
- Public Service Commission, 1992. Human resources plan for the Public Service of Western Samoa. Apia, Western Samoa, May.
- Public Works Department, 1991. Project proposals for Western Samoa's Seventh Development Plan 1992-1994. Prepared by Tuutu I. Taulatolo. Apia, Western Samoa, June.
- Schultz, T. W. 1961. Investment in human capital. American Economic Review, vol. 51.
- SPAFH. 1991. Tables of Demographic Data for the SPAFH Member Countries. South Pacific Alliance of Family Health, Port Moresby, Papua New Guinea.
- Specht, J.R. 1978. A Basic Plan for the Development of a National Cultural Centre in Western Samoa. UNESCO Contract no. 590106, January.
- SPREP 1992. The Pacific Way Report prepared for Pacific Islands for UNCED by the South Pacific Regional Environment Programme with the financial assistance of the Asian Development Bank and the United Nations Development Programme. South Pacific Regional Environment Programme, Noumea, New Caledonia.

- Eudealo, I. S. 1990. Evaluating the Technical Training Program at the Western Samoa Technical Institute. Dissertation for Master of Urban and Regional Planning, University of Sydney, Sydney, Australia.
- Eudealo, I.S. 1993. Western Samoa: State of the Environment Report. South Pacific Regional Environment Programme, Apia, Western Samoa.
- Tausie, V. 1980. Art in the New Pacific. Institute of Pacific Studies, University of the South Pacific, Suva, Fiji.
- Taylor, L.M. 1991. Western Samoa: An investigation into the sources and regulations of marine pollution. July. unpub.
- Tofilau, E. A. 1991. Keynote address at the Ground Breaking Ceremony for the new government office building, Apia, Western Samoa, 26 September.
- Tofilau, E.A. 1992. Address at the United Nations Conference on Environment and Development, Rio de Janeiro, Brazil, June.
- United Nations Conference on Environment and Development. 1992. Agenda 21, Rio Declaration, Forest Principles. Draft, Rio de Janeiro, Brazil.
- Warren, P. & Saurich, W. 1992. Legal Consultancy for Division of Environment and Conservation, Western Samoa. Department of Conservation, Wellington, New Zealand.
- Wass, R.C. 1984. An Annotated Checklist of the Fishes of Samoa. National Oceanic and Atmospheric Administration, US Department of Commerce, technical report SSRF-781.
- Waugh, J., Lawless, P. & Chadderton, L. 1991. Atulilo Hydroelectric Power Project: Environmental Impact Assessment. South Pacific Regional Environment Programme/Department of Conservation, New Zealand, Wellington, New Zealand, December.
- Wells, G. 1987. Streamlined program evaluation procedures for program managers and staff. Program Evaluation Bulletin, vol. 1, March, Public Service Board of New South Wales, Sydney, Australia.
- Whistler, W.A. 1992a. The vegetation of Samoa and Tonga. Pacific Science, vol. 46, no. 2, pp. 150-178.
- Whistler, W.A. 1992b. National Biodiversity Review of Western Samoa. In An Overview of the Terrestrial Biodiversity of Pacific Islands Including those Islands Covered by the Biodiversity Programme of SPREP ed. D.R. Given. Global Environmental Facility, South Pacific Regional Environment Programme, Apia, Western Samoa.
- World Bank. 1991. Towards High Growth in Pacific Island Economies: Lessons from the 1980s, vol. 2, Country Surveys. Washington, DC, USA.
- Wuolera, Barlow & Morrison Pty Ltd. 1987. Environmental Impact Assessment. Hydropower Project at Atulilo, Upolu, Western Samoa, report no. 3469, 30 October.
- World Commission on Environment and Development. 1987. Our Common Future. Brundtland Report, United Nations. Oxford University Press, Oxford, England.
- Young, G. 1991. Authenticity in cultural conservation. Australian Planner, vol. 20, no. 1, March.
- Zann, L. 1991a. The Inshore Resources of Upolu, Western Samoa: Coastal Inventory and Fisheries Database. Field report no. 3, FAO/UNDP project SAM/89/002.
- Zann, L. 1991b. The Status of Sea Turtles in Western Samoa. Field report no. 9, FAO/UNDP project SAM/89/002.
- Zann, L. 1991c. Fishery resources assessment for management, project findings: Recommended actions. Second draft of terminal report, FAO/UNDP project SAM/89/002.