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national environmental management strategy

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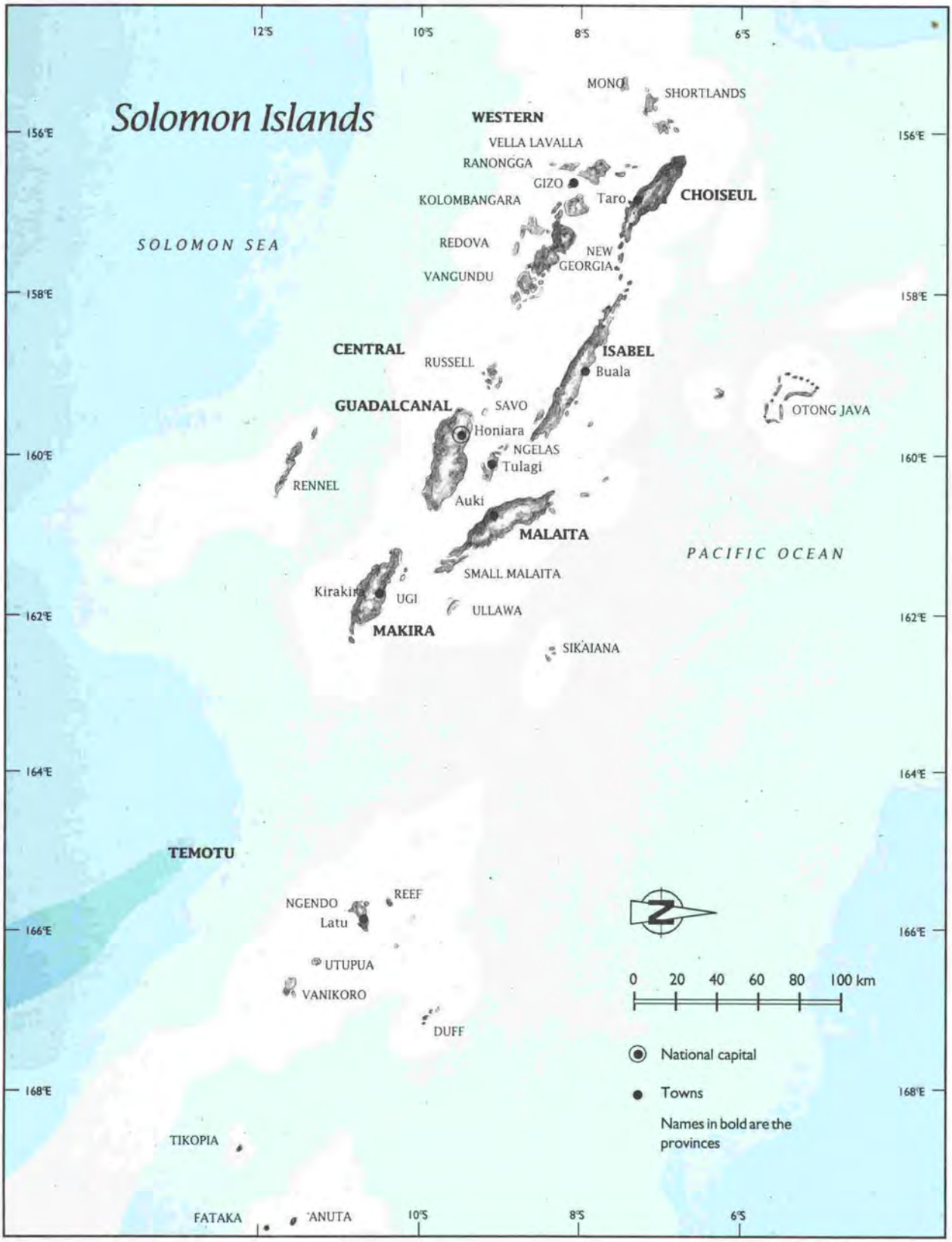
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TIKOPIA
FATAKA
ANUTA
0 20 40 60 80 100 km
National capital
Towns
Names in bold are the provinces

Foreword

The Government of Solomon Islands recognises the importance of our environment to the health, welfare and economic development of the nation and for that reason Cabinet endorsed the development of a National Environmental Management Strategy (NEMS) in 1991. The Environment and Conservation Division within my Ministry has responsibility for management of the environment of Solomon Islands. However, the environment and environmental issues cut across all sectors and hence Cabinet recommended that a National Task Force on Environment and Sustainable Development be established to oversee the development of the NEMS. The other ministries involved in this Task Force are: Home Affairs, Tourism and Aviation, Finance and Economic Planning, Education and Human Resources Development, Provincial Government, Health and Medical Services, and Office of the Prime Minister.

The National Environmental Management Strategy has involved extensive consultation throughout its development with other ministries and in particular, with all eight provincial governments. The NEMS outlines the key environmental issues in Solomon Islands and identifies strategies to address them. The NEMS reflects the ideas and recommendations of many people; this will be important to its implementation as the Strategy truly belongs to the people of Solomon Islands. The Strategy itself is a first step forward to ensuring sustainable economic development and sound environmental management in Solomon Islands.

The Government of Solomon Islands will try to ensure the implementation of strategies outlined in the NEMS, particularly in the priority areas recommended by the Task Force, such as: environmental awareness and education; environmental impact assessment of policy and development projects; introduction of comprehensive environmental law; strengthening environmental administration; and promoting sustainable use of forest resources.

The Government is grateful for the financial and technical support provided by the Asian Development Bank (ADB) and the World Conservation Union (IUCN) and for the collaborative assistance of the South Pacific Regional Environment Programme (SPREP) in co-ordinating this Regional Environmental Technical Assistance Project (RETA) and hence the development of the NEMS for Solomon Islands. The Government of Solomon Islands welcomes the opportunity of working alongside ADB, IUCN and SPREP in the implementation of the Strategy.

I would urge ADB, IUCN and SPREP as well as other bilateral and multilateral donors to come forward to participate in and support the implementation of this Strategy, to ensure that both economic growth and environmental quality are maintained for this and future generations.

Victor Ngele
Hon. Minister for Natural Resources

Contents

part II

Environmental action strategies & programmes

Note

- In the Table of Contents and in the body of the report, programme profiles have been prepared for those programmes marked with an asterisk (*). These profiles have been prepared to a general format required in initial programme identification by development assistance agencies and are contained in Appendix 1.
- All costs in this document are identified in Solomon Islands dollars (SI).

Acknowledgments

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Walter Ramo, Permanent Secretary, MNR, James Roni, Under-Secretary, MAL, and Emilio Bulu, Under-Secretary, MPG, were the key chairpersons of the National Environmental Management Strategy Seminar and guided it to the success it undoubtedly was.

The group leaders of the Seminar's seven working groups provided invaluable input to group activity and kept discussion on the track, making good use of the limited time for discussion on such a wide range of issues and prospects for sustainable development. These group leaders were:

Abraham Baeanisia
Director
Solomon Islands Development Trust

Fr John Lapli
Premier
Temotu Province

Peter Hauia
(Acting) Provincial Secretary
Isabel Province

Thornley Hite
Deputy Provincial Secretary
Guadalcanal Province

Jack Watealaha
(Acting) Provincial Secretary
Malaita Province

Albert Wata
Chief Fisheries Officer
Ministry of Natural Resources

Henry Isa
Principal Conservation Officer
Ministry of Natural Resources

A group of senior government officials gave all the assistance possible to the NEMS exercise; their support greatly facilitated the preparation of this NEMS and without their advice the content would have been considerably less pertinent.Particularly notable amongst these are:

Walter Ramo
Permanent Secretary
Ministry of Natural Resources

Pattison Oti
Permanent Secretary
Ministry of Provincial Government

Emilio Bulu
Under-Secretary
Ministry of Provincial Government

Steve Likaveke
Chief Physical Planner
Ministry of Agriculture & Lands

Walton Abuito'o
Deputy Head
Policy Evaluation Unit, OPM

Henry Isa
Principal Conservation Officer
Environment & Conservation Division
Ministry of Natural Resources

Victor Totu
Director
Guadalcanal Province Cultural Centre

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Head, School of Natural Resources, Solomon Islands College of Higher Education

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Walton Abuito'o
Deputy Head
Policy Evaluation Unit
Office of the Prime Minister

Shadrack Fanega
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Ministry of Finance & Economic Planning

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Ministry of Natural Resources

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Ministry of Natural Resources

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Under-Secretary
Ministry of Tourism & Aviation

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Under-Secretary
Ministry of Home Affairs

John Saunana
Under-Secretary
Ministry of Education & Human Resources Development

George Scott
Chief Surveyor
Lands Division
Ministry of Agriculture & Lands

Henry Isa
Principal Conservation Officer
Ministry of Natural Resources

The SPREP Team comprised: David Sheppard, Team Leader; Tanya Leary, Solomon Islands local environmental adviser to SPREP; Dr Bob Thistlethwaite, environmental adviser; Professor Ben Boer, legal adviser; and Milena Bellini, who provided legal assistance to Ben Boer. To Tanya Leary must go special thanks for her excellent efforts, firstly in preparing the State of the Environment Report in close consultation with provincial and national organisations, then in organising the NEMS Seminar, and subsequently in the preparation of the NEMS itself. Bob Thistlethwaite handled report production and also identified needs for strengthening environmental administration in the National Government. Ben Boer conducted a review of environmental legislation for SPREP as part of the RETA.

David Sheppard
RETA Team Leader

Message from the ADB

The Asian Development Bank is pleased to associate in assisting one of the Pacific region's most ambitious undertakings — the preparation of National Environmental Management Strategies (NEMS) in a number of Pacific countries. This assistance has been provided through a Regional Technical Assistance grant to the South Pacific Regional Environment Programme (SPREP). The World Conservation Union (IUCN) has also collaborated in providing technical advisory services.

Our involvement reflects two factors. Firstly, our confidence in SPREP as one of the prime sub-regional, environmental organisations in the Asia Pacific region. The Bank has been pleased by the way in which SPREP has co-operated closely with member governments in addressing environmental issues in island countries and by the calibre of SPREP's staff work as well as the work of the national task forces which guided the country level activities.

The second factor is a commitment by the Bank to sustainable development. We are acutely aware of the vital importance of economic development for the Pacific Island countries and are equally concerned for the limited natural resources and often fragile nature of the environment of these countries. It is thus critical that development continues, but in a manner which is truly sustainable ecologically. Only by following such a course of action can the quality of life currently enjoyed by Pacific people be assured for future generations.

The need for sustainable use of natural resources has been the underlying theme of the NEMS documents. The preparation of NEMS has been a challenging task and has involved a wide range of government and non-governmental organisations in each country. The nature of the issues and the complexity of the challenges faced have been great. As ever, Pacific countries have risen to the challenge and I believe the commitment shown in the development of the Strategies is a true reflection of the intimate bond which Pacific Island peoples have with their environment. Nonetheless, this "commitment" and "challenge" has now to be put to visible action programmes.

The Asian Development Bank welcomes the publication of the National Environmental Management Strategy for Solomon Islands. It is an important event for environmental management in Solomon Islands and the Bank will be pleased to consider ways and means of assisting with its implementation.

Dr Kazi F Jalal
Chief, Office of the Environment
Asian Development Bank

Message from SPREP

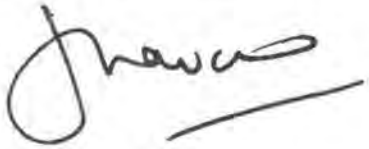
We Pacific Islanders share a common aspiration for economic development and improved living standards for our people. However, we are aware that this development cannot be at the cost of the environment. We have lived in close harmony with our island environment for thousands of years and we are well aware of its importance to our way of life. We face the complex challenge, in common with many other countries of the world, of achieving economic development in a way which will not significantly affect our environment. This major challenge must be addressed if our Pacific way of life is to survive.

The development of National Environmental Management Strategies (NEMS) has been a major tool in addressing these issues. This development was made possible through the generous financial and technical assistance of the Asian Development Bank and the World Conservation Union (IUCN). This assistance is gratefully acknowledged.

This NEMS is a practical document which aims to identify the major environmental issues in Solomon Islands and the priority environmental programmes which are required to address them. The emphasis has been on ownership of the NEMS by the government and people of Solomon Islands. The process which has resulted in the preparation of the NEMS has involved many participants and has been directed by a National Task Force on Environment and Sustainable Development, comprising relevant government and non-governmental organisations in Solomon Islands.

The NEMS process has proved a most useful vehicle for raising awareness of environmental issues. In the wake of the United Nations Conference on Environment and Development (UNCED) the NEMS also provides the foundation for implementing much of Agenda 21 in Solomon Islands. However, the success of the NEMS exercise will ultimately be judged by its implementation. If the NEMS sits on a shelf and gathers dust, then the exercise has failed.

SPREP looks forward to working with Solomon Islands and with other regional and international organisations in the implementation of the NEMS.



Vili A. Fuavao
Director
South Pacific Regional Environment Programme

Acronyms

ACIAR	Australian Centre for International Agricultural Research
ADB	Asian Development Bank
AG	Attorney General's Chambers (SIG)
AIDAB	Australian International Development Assistance Bureau
AIMS	Australian Institute of Marine Science
CITES	Convention on International Trade in Endangered Species of Wild Fauna & Flora
EC	European Community
ECD	Environment & Conservation Division, MNR (SIG)
EEZ	Exclusive Economic Zone
EIA	environmental impact assessment
ESCAP	Economic & Social Commission for Asia & the Pacific
FD	Forestry Division, MNR (SIG)
FOB	free on board
FY	financial year
GBRMPA	Great Barrier Reef Marine Park Authority
GDP	gross domestic product
GIS	geographic information system
GNP	gross national product
HMA	Honiara Municipal Authority
ICBP	International Council for Bird Preservation
ICLARM	International Centre for Living Aquatic Resources Management
IFTA	Insect Farming & Trading Agency (PNG)
IUCN	The World Conservation Union
MAL	Ministry of Agriculture & Lands (SIG)
MCTPI	Ministry of Commerce, Trade & Primary Industry (SIG)
MEHRD	Ministry of Education & Human Resources Development (SIG)
MFEP	Ministry of Finance & Economic Planning (SIG)
MHA	Ministry of Home Affairs (SIG)
MHMS	Ministry of Health & Medical Services (SIG)
MNR	Ministry of Natural Resources (SIG)
MPG	Ministry of Provincial Government (SIG)
MTA	Ministry of Tourism and Aviation (SIG)
NEMS	National Environmental Management Strategy
NGO	non-governmental organisation
ODA	Overseas Development Administration
OPM	Office of the Prime Minister (SIG)
PIDCs	Pacific Island Developing Countries
PNG	Papua New Guinea
PS	Permanent Secretary
RETA	Regional Environmental Technical Assistance Project (ADB/IUCN/SPREP)
SICHE	Solomon Islands College of Higher Education
SIG	Solomon Islands Government
SOE	State of the Environment Report
SOPAC	South Pacific Applied Geoscience Commission, Suva, Fiji
SPC	South Pacific Commission, Noumea, New Caledonia
SPREP	South Pacific Regional Environment Programme, Apia, Western Samoa
TA	technical assistance
TCSP	Tourism Council of the South Pacific
UNCED	United Nations Conference on Environment & Development
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
US	Under-Secretary
USP	University of the South Pacific
WCED	World Commission on Environment & Development
WCS	World Conservation Strategy
WWF	World Wide Fund for Nature

Executive summary

Background

The development of a National Environmental Management Strategy (NEMS) will help Solomon Islands pursue a true path of sustainable development. The nation's economic development cannot be sustained in the mid to long term without due consideration for the effects of human action on the national environment — whether social, built or natural. Continued economic well-being is tied to a productive and healthy environment; protection of the environment therefore makes plain good business sense.

The thrust for the development of a NEMS arose from a request in 1990 by the Government of Solomon Islands to the South Pacific Regional Environment Programme (SPREP) for assistance on a number of environmental initiatives. This led to the inclusion of Solomon Islands in the Asian Development Bank's Regional Environmental Technical Assistance Project (RETA 5403) to strengthen the environmental capability of five of its Pacific Island member countries.

To oversee the RETA Work Plan and the development of the NEMS in Solomon Islands, Cabinet appointed a National Task Force on Environment and Sustainable Development in April 1991, comprising representatives from eight ministries — Natural Resources, Home Affairs, Provincial Government, Health and Medical Services, Tourism and Aviation, Finance and Economic Planning, Education and Human Resources Development, and Office of the Prime Minister.

The NEMS is the result of intensive formal and informal consultation involving ministries of the Government of Solomon Islands, all eight Provincial Governments and representatives of non-governmental organisations.

The development of the NEMS involved a number of tasks. These included: the preparation of a State of the Environment Report for Solomon Islands; the preparation of Sector Environmental Reports in consultation with national government resource management sectors; and the preparation of Provincial Environmental Reports in consultation with all provincial governments. Reviews were also made of environmentally relevant legislation and of institutional arrangements for environmental administration. The prepared reports then formed the information base to a major National Environmental Management Strategy Seminar held 19–21 November 1991 in Honiara, with over 70 participants including Provincial Premiers, Provincial Members, Area Council members, senior national and provincial government officers, non-governmental organisations and other interested individuals (see Appendix 2). The strategies and programmes which were identified by Seminar participants were then drafted into a NEMS report. That preliminary document was subsequently revised and amended following further consultations with both individuals and organisations, and with national and provincial government leaders and officials. As a result, the NEMS before you is truly a national document developed by Solomon Islanders for Solomon Islands.

Overview of proposed strategies & programmes

The NEMS lays out a blueprint for environmental priorities to the end of the decade. It is in fact based on a collection of 29 strategies designed to address environmental problems encountered in Solomon Islands. The planned implementation of many of these strategies is expressed through a number of programmes — 48 in all — which were selected by Seminar participants. From these 48 these programmes, 41 brief profiles have been prepared (see Appendix 1) which outline aims, scope, estimated costs, likely executing agencies, potential issues and timing; programmes for which profiles have been prepared are marked in the Table of Contents and in the text with an asterisk (*).

The 29 strategies have been grouped into ten environmental objectives which collectively point the way towards the ultimate goal of fully sustainable devel-

opment throughout Solomon Islands. These organisational headings are:

1) integrating environmental considerations in economic development;
2) improving environmental awareness & education;
3) strengthening the resource database;
4) protecting areas of high ecological, wilderness & cultural value;
5) improving waste management & controlling pollution;
6) land resource management (excluding forestry);
7) sustainable use of forest resources;
8) sustainable use of marine resources;
9) ensuring the coastal environment is well managed; and
10) ensuring that exploitation of non-living resources is environmentally safe.

1. Integrating environmental considerations in economic development

The Seminar saw a clear need for an effective, national approach which integrated economic and environmental considerations. Participants saw as a major strategy the development and adoption of an integrated approach to physical planning, economic planning and environmental protection at both national and provincial levels of government, and, where feasible, extending to the Area Council level within provinces. Such a strategy would require some integration institutionally and procedurally of the national government's policy evaluation, economic planning, physical planning, environmental protection and sectoral development programming activities. Such planning and policy co-ordination at the national level would need to be reflected at the provincial level and here the lack of sufficient numbers of trained staff to serve all eight provinces was clearly evident.

Such a strategy also requires a complementary strategy of introducing a framework of national and provincial environmental law, together with the means for its enforcement in a communally acceptable manner. The legal review conducted under the RETA indicated that it is possible to enact legislation which integrates much of the present resource management and conservation legislation within one statute, a development which would fully accord with the views of the NEMS Seminar participants and therefore of this NEMS.

The broad policy strategy for closer integration of economic, physical and environmental planning and policy development also leads in the NEMS to the presentation of four options for an institutional restructuring within the National Government. This would see the development of a closer functional relationship between the Environment and Conservation Division of the Ministry of Natural Resources, the Physical Planning Division of the Ministry of Agriculture and Lands, the Economic Planning Division of the Ministry of Finance and Economic Planning, and the Policy Evaluation Unit of the Office of the Prime Minister. The options are not mutually exclusive but rather could be considered as a progression from a position of least initial change, which is essentially the maintenance of the status quo, to an ultimate longer term objective which is seen as the formation of an Environmental Planning and Assessment Authority as a corporate body under its own Act, responsible directly to the Prime Minister and Cabinet.

The adoption of environmental impact assessment (EIA) as a routine administrative procedure was strongly advocated by NEMS Seminar participants and framed into a strategy to be applied to both private and public sector development proposals and to gov-

ernment policy developments which are likely to have significant environmental impact. The Seminar participants strongly held the view that the principle of final acceptance or rejection of environmental impacts of development proposals rests with the Provincial Governments, not the National Government. Programmed tasks to further this strategy include the development of national guidelines for the application of EIA, and minimum environmental standards for pollution control. From these the provinces could develop their own standards, if desired, to an even more stringent quality pollution control level. However, standards and guidelines on their own are not enough; they must be accompanied by detailed administrative procedures for their implementation and the necessary training of officers responsible for EIA.

Other strategies focused on the need for economic policies for achieving sustainability, including the institution of resource pricing in the National Accounts.

2. *Improving environmental awareness & education*

For environmental management to be effective in the long term, an informed and supportive public is obligatory. Nothing was considered to have higher priority than the need to raise the environmental awareness of the community. Strategies were aimed at upgrading both formal and informal environmental education in Solomon Islands. Priority programme areas were: the establishment of an Environmental Education and Information Unit; the conduct of provincial and district environmental awareness workshops; improvement of the environmental content of school curricula; environmental curriculum development for religious seminaries; development of environmental information; and training of environmental awareness trainers. Support for the development of "grass-roots" community education, calling for close involvement by traditional and elected leaders and members of the Church, was seen as particularly important.

Of very high priority was a strategy aimed at the preservation of traditional knowledge and management systems. A programme was framed to document this knowledge and build upon it to improve the productivity of traditional agricultural practices, while safe-guarding the protective role which nature-intensive systems usually have on the environment. The Improved Traditional Temotu Agriculture system was seen as one example of how traditional knowledge may be incorporated into foreign agricultural management systems.

3. *Strengthening the resource database*

A number of strategies were directed to strengthening the base of knowledge of Solomon Islands resources so the planning of resource utilisation could be improved. Solomon Islands is fortunate, in general Pacific terms, in the quality of its existing land resource database, but much of this information dates from colonial times. There are also many important gaps in essential knowledge which must be filled as soon as possible; without this knowledge it is believed sustainable use of natural resources simply cannot be attained. Four programme areas identified were: an ecological survey of terrestrial vertebrate fauna; a systematic botanical survey; a survey of dugong (an endangered species); and a broad survey of reef, estuary and lagoon resources.

4. *Protecting areas of high ecological, wilderness & cultural value*

The need for protection and management of endangered species and of areas of major ecological, cultural, historic and other scientific value was high on the discussion agenda in the NEMS Seminar workshops. Solomon Islands has a unique environment, but currently has no operating protected areas or re-

serves of any kind. Approaches attempted in Solomon Islands to foster the establishment of protected areas have met with little success as they failed to pay due regard to customary land tenure, traditional practices and enforcement.

Four strategies were developed which would all help ensure that areas of high ecological value and species are not lost. A strategy for the development of conservation areas and reserves includes a programme for the development of a model conservation area for Solomon Islands with full landowner participation; this is seen as the key to any real prospect for protected areas establishment and could well serve as a model for wider Melanesia. Solomon Islands would continue to participate in regional and international biodiversity programmes and undertake detailed verification studies of areas already identified as being of significance, both terrestrial and marine. Another strategy is to promote eco-tourism (nature-based tourism), and, in doing so, endorsing the major "Solomon Islands Tourism Development Plan 1991–2000" with its identification of Priority I and II development areas. A third and high priority strategy is to protect and manage Solomon Islands wildlife by having the authorised wildlife trade placed on a sustainable basis, well managed and not unduly threatening wild populations of animals; the key to this would be the successful establishment and regulation of farming and ranching of economically valuable wildlife species, and the establishment of an insect marketing agency for controlling the export insect trade.

5. *Improving waste management & controlling pollution*

Solomon Islands is becoming increasingly polluted, particularly in the environs of the main population centres. The disposal of solid wastes and sewage is recognised as a troublesome environmental problem and a number of strategies were developed which aim to improve waste management and pollution control, both through direct action and through special community education programmes. The reduction of pollution from industrial processing and the administration of hazardous chemicals were targeted, as was the problem of disposal of stocks of unwanted biocides. Air pollution from the unnecessary lighting of grass fires and also from dust from unsealed roads carrying frequent traffic was also a growing concern, especially around Honiara.

6. *Land resource management (excluding forestry)*

In rural areas, although there is generally no shortage of land, the increasing pressure to produce cash crops has caused an intensification of land use. This is manifested in greatly reduced fallow periods and, in the absence of costly inputs such as fertilisers and biocides, must lead to land degradation. While such degradation is not yet a widespread concern in Solomon Islands, two strategies were developed which would serve to protect the agricultural base of the country. These were: to protect the best soil for food crop production rather than see its continued use for plantation export crops; and to promote efficient forms of traditional agroforestry practice.

7. *Sustainable use of forest resources*

Forestry and forest-related issues were a major focus of attention in the development of the NEMS, with particular concern focused on existing forestry logging operations and forest management practices. The concern about forest utilisation included the nature and scale of its operation, soil damage, water pollution, loss of biodiversity, and shortage of traditional bush materials for building, food and medicine. The lack of sustainable forest management was of great concern, with an enormous disparity between areas of forest being harvested and areas being reforested and managed.

The strategies developed for this area were: to promote sustainable forest management; to improve

community awareness of forestry issues; and to expand reforestation on customary land and increase the capability of landowners to manage commercial forestry operations on their land in a sustainable manner with minimal damage to the environment. Traditional knowledge about forest use should be documented and incorporated, where appropriate, in forestry policies and management practices. One important activity required in the pursuit of these strategies was to identify clearly the respective roles of provincial and national governments in the administration of the nation's forest resource.

8. *Sustainable use of marine resources*

Solomon Islands is heavily dependent on its marine resources, both for subsistence and as a major source of revenue. Therefore, in seeking a sustained yield of a variety of marine foods for the people of Solomon Islands, it is vital that damage to fisheries habitats be minimised. At the same time the potential for increasing the commercial harvest or production of valuable marine exports must be explored, but on a sustainable basis. With such commercial harvest, there is a need to ensure an equitable financial return to the nation. The core strategies, however, concern the reduction of over-harvesting of reefs and lagoons and protection of reef fishery habitat; and the conservation of endangered species, notably turtles and crocodiles, and the establishment of marine reserves.

9. *Ensuring the coastal environment is well managed*

The planning and implementation of coastal management was identified by the NEMS Seminar and also by provincial groups as a high priority area for action. The prime strategy was to prepare coastal environmental management plans for a number of areas already identified as having coastal environmental problems. The Noro and Tulagi areas had first priority but other areas of concern were identified by each province. Because of its extensive areas of mangroves, and the importance of these for marine life and for coastal protection, Solomon Islands would give high priority to a strategy to protect mangroves. This would first require proper survey and, where necessary, the institution of mangrove reforestation; this would be coupled with educational programmes on the great value of mangroves to the community. Sustainable forms of mangrove utilisation which would help support village economics would also be examined.

10. *Ensuring that exploitation of non-living resources is environmentally safe*

Solomon Islands is a young nation which must exploit every asset it possesses in order to advance its economic base as fast as possible. This includes all living and non-living resources. However, while the principle of sustainable use can be applied to living resources, the exploitation of non-living resources cannot be a sustainable activity for the simple reason that such resources, once used, cannot be replaced. Consequently, the extractive industries must continue to seek prospective mineral resources and develop them if the industry is to survive. The environmental concern is to keep inevitable damage from mineral exploration and mining activity to a minimum, while still taking full advantage of nature's bounty.

While the country has available to it a range of possible alternative sources of power, including hydro-electricity, geothermal, biomass, wind and solar, it is heavily dependent on imported fuel for electricity generation. The Solomon Islands Government plans to use hydro-electricity to supplement its power needs for Honiara; there is also a prospect for greater use of solar power, particularly for village lighting, but also for air-conditioning, hot water and refrigeration needs in major commercial buildings in Honiara. Within a strategy for the promotion of alternative forms of energy to imported fossil fuels, a

programme has been proposed for the study of the use in Solomon Islands of technology for supplementing diesel-generated power with solar-generated electricity.

Implementation of strategies & programmes

Without the will and commitment needed for its implementation, the NEMS is pointless. Hence the selection of a core team who will oversee its implementation is of vital importance. The National Task Force on Environment and Sustainable Development has the mandate from Cabinet to oversee the implementation of the NEMS. This was constituted as a large body with 17 members. The NEMS advocates the continuation of the Task Force, but in a slimmed-down form with perhaps no more than eight members, and including representation from the private business sector. This Task Force would play an advisory role to the Minister responsible for environmental matters and to Cabinet.

In total, the proposed NEMS strategies and programmes call for an expenditure of about $SI 16.82 million over the period 1992–2000 (roughly equivalent to $US 5.7 million). Most programmes are small-sized, but a few would require quite significant expenditure of funds (particularly $SI 5.725 million over seven years for the major proposed systematic botanical survey and the survey of terrestrial vertebrate fauna, together with a $SI 1.7 million programme for improving the disposal of solid wastes). Should these programmes be excluded, total estimated cost for NEMS implementation reduces to $SI 9.395 million ($US 3.19 million).

With the magnitude of funding called for by the NEMS (within the specified time frames of the programme profiles), it would be unrealistic to expect that Solomon Islands would be able to attract from multilateral or bilateral donors the level of financial assistance required to fund all programmes in their entirety over the eight years or so, 1993–2000. Nevertheless, the identification of these strategies and programmes remains an important first step in ensuring the environment of Solomon Islands is well managed. Recognising the funding constraint, the Task Force undertook an exercise to identify the ten top priority programmes or programme areas for which implementation over the next five years was considered urgent. These priorities were then ranked in order of importance. This exercise took into account the top ten priority programmes identified by each province for its area (see Chapter 13). The top priorities identified by the Task Force are listed below in descend-ing order of perceived importance, together with cost estimates:

Priority 1
Improve environmental awareness and education *($SI 1.17 million over 5 years).*

Priority 2
Develop standard EIA guidelines and administrative procedures for national and provincial governments *($SI 160,000).*

Priority 3
Strengthen the resource information database, with greatest emphasis on that of reef, estuary and lagoon, but also including botanical survey, terrestrial vertebrate fauna survey, and dugong and seagrass survey *($SI 450,000 estimate for reef, estuary and lagoon survey).*

Priority 4
Strengthen existing environmental institutions and administration (with consideration of the four proposed NEMS institutional options as a matter of urgent need).

Priority 5
Introduce a comprehensive framework of environmental law with umbrella environmental national legislation reflecting the role of provincial authorities.

Priority 6
Expand customary land reforestation *($SI 1.2 million over 5 years).*

Priority 7
Improve customary landowner awareness of forestry processes and issues *($SI 410,000).*

Priority 8
Provide assistance to landowners to enable them to extract and market timber from their own land using small-scale, controlled and sustainable harvesting methods *(a cost has not been estimated).*

Priority 9
Preserve traditional knowledge and management systems *($SI 570,000).*

Priority 10
Develop coastal environmental management plans for areas with existing environmental problems *(a total of $SI 790,000 with $290,000 estimated for the highest priority areas of Noro and Tulagi).*

The estimated cost of these priorities is $SI 4.8 million, plus provision for funding for Priorities 4, 5, and 8. Were $400,000 to be allocated for technical assistance with Priorities 4 and 5, including staff recruitment, and a further $1 million allocated for Priority 8, then an overall estimate for planning purposes would be $SI 6.2 million ($US 2.1 million). Timing of programme initiation and completion will ultimately depend on the availability of human resources and of funds and this presents a major job for the National Task Force on Environment and Sustainable Development as it pursues its role for overseeing the implementation of the NEMS. A vigorous campaign will need to be mounted for securing development assistance monies from donor agencies, both as technical assistance and grants-in-aid, and possibly also in the form of "environmental loans" from a regional lending organisation.

Review

This National Environmental Management Strategy is simply one snapshot in time. The strategies and programmes developed to address environmental problems and concerns are framed in the context of needs as perceived by Solomon Islanders today. What the future holds no one knows; but we can be sure that changes to the NEMS will be needed in the short term, so rapidly is development taking place. An annual review in the context of budget estimate preparation has been advocated. In addition, a major review of the NEMS should be undertaken in five years (1997). This might be best achieved by holding a national workshop following a series of workshops within each province. From this review process should emerge a new NEMS which will not only serve Solomon Islands for the following five years, but also set a framework which will help carry it well into the 21st century.

part I

The Solomon Islands setting

About the NEMS

1.1 Why an Environmental Management Strategy?

Environmental management strategies are a means of linking development and conservation. They are realistic only if they are derived in part from a wide participatory process of problem recognition, planning and policy generation across all levels of society. The strategies are effective only if they include action to turn the plans and policies into results; the actions should be time bound, with specified indicators of achievement.

Successful strategies have four components in common, as outlined in *Caring for the Earth. A Strategy for Sustainable Living* (IUCN/UNEP/WWF 1991, Annex 8, p.204):

- consultation and consensus-building;
- database development and analysis;
- policy formulation; and
- action plans and implementation.

In all countries, the consultation process is vital to the development of any management strategy where its implementation depends largely on the action of

(photo: SPREP)

individuals and communities. This is especially true of an environmental strategy. General agreement on a course of action means consensus; if there is no consensus, all the legal mechanisms in the world will prove ineffective. The strategy will not be "owned" by the people, and without ownership compliance is most unlikely to be achieved in a small, closely knit island society.

Effective strategies are built on facts (IUCN/UNEP/WWF 1991). Information is needed on people, on the economy, on natural resources and state of the environment, and on institutions, laws and policies which promote or obstruct sustainable development. This information must be stored in a readily accessible form and be capable of regular updating and ready analysis by non-specialists. However, all the information considered necessary for a rational decision on resource use and environmental management is rarely available in the Pacific. The best decision must often be made on the basis of the available information, however imperfect that may be; as additional information becomes available, policies and programmes can be adjusted and, provided the initial decision did not result in irreparable environmental damage, this is perhaps the best that can be expected.

Agreed policies to achieve sustainable development are formulated on the basis of information analysis, through continued consultation and consensus-building.

The process to develop this strategy has been one of consultation and consensus-seeking from the outset, but this was limited through financial constraints and time available to national and provincial levels of government and to some non-governmental organisations (NGOs). Consultation at the Area Council and village level was limited, and further consultation would have been desirable with NGOs, particularly the church organisations.

The strategy must inevitably be weakest in the areas of database and analysis, and existing policy; in some resource areas facts are few and even then analysis is limited. There is currently no official national government environment policy and consequently there are no clear directives for environmental management and conservation at this level of government. At the provincial level, Western Province has been active in environmental policy development, but the other seven provinces have yet to follow this lead.

Limited information and lack of formal policy inevitably result in action plans that are not developed to the extent they might otherwise be. Nevertheless, the strategy and programmes arising from this exercise are a constructive step along the road to more refined strategies and perhaps different tactics which can evolve as these deficiencies are addressed.

1.2 The World Conservation Strategy

In 1980, the international organisations of the World Conservation Union (IUCN), United Nations Environment Programme (UNEP), and the World Wide Fund for Nature (WWF) published the *World Conservation Strategy*. This strategy recognised that the pursuit of conservation could not be achieved globally without development to alleviate the poverty and misery of millions of people. This interdependence of conservation and development gave rise to the phrase "sustainable development". The clear message it gives is that, if the planet's fertility and productivity are not protected, then the future of the human race is at risk.

The World Conservation Strategy emphasised three objectives:

- essential ecological processes and life-support systems must be maintained;
- genetic diversity must be preserved;
- any use of species or ecosystems must be sustainable.

The 1987 report of the World Commission on Environment and Development (WCED) brought to the

environmental debate a clear understanding of the global interdependence between economics and environment. The year 1987 also saw the groundwork laid for the preparations for the Earth Summit, the United Nations Conference on Environment and Development held in Rio de Janeiro, Brazil, in June 1992 and for which Solomon Islands prepared a National Report (SIG 1991).

In October 1991 the IUCN, UNEP and WWF published in partnership *Caring for the Earth: A Strategy for Sustainable Living.* To quote from the Foreword to that report (page 2):

> *Caring for the Earth has been prepared through a wider process of consultation than was possible when we wrote the World Conservation Strategy a decade ago. It is intended to re-state current thinking about conservation and development in a way that will inform and encourage those who believe that people and nature are worth caring about and that their futures are intertwined. It is also intended to persuade people at all levels that they can do something or help cause something to be done, that will lead to a better care for the Earth.*

It would be foolish in preparing the strategy for Solomon Islands not to pay close attention to *Caring for the Earth*; some strategies which have been considered directly relevant to the Solomon Islands situation have been adopted or adapted for this report.

1.3 Scope of the NEMS

This National Environmental Management Strategy (NEMS) is merely a long-term perspective of a suite of strategies and programmes through which Solomon Islands may achieve prosperous, but sustainable, national development. Given the many limitations imposed on the Government of Solomon Islands at both national and provincial levels in human resources, finance, and physical infrastructure, the NEMS must necessarily be viewed as one snapshot in time. While striving to keep strategies and programmes within the bounds of common sense, the NEMS looks towards the ideal situation. Thus, the number of both programmes and actions suggested for government consideration is large, and certainly not achievable within the next five years, or even within the next decade.

The National Task Force on Environment and Sustainable Development prepared a list of programmes as priorities for consideration for the period 1992–1997. However, policy decisions on the strategies and programmes which should receive priority attention are rightly matters for Government, and any suggestions made in this NEMS should be viewed in that light.

The setting

(photo: T. Leary)

A national environmental management strategy must necessarily be formulated in the context of the overall natural, socio-economic, cultural and political environment. This chapter provides a brief overview of Solomon Islands in terms of its location and size, climate, land, sea and people. It is not the intention to reproduce here the detailed information contained in the State of the Environment Report (Leary 1991b), but merely to highlight central issues which provide a necessary background for the reader in order to follow the discussion of environmental strategies. The reader is constantly referred to the appropriate section of the SOE should further detailed information be sought.

2.1 Location & size *(SOE 1.2)*

Solomon Islands lies in the south-west Pacific between latitudes 5°S and 12°S and longitudes 152°E and 170°E, running along a north-westerly south-easterly axis from Papua New Guinea towards Vanuatu. It consists of a double chain of six major islands (see Map, page ii), some 30 smaller islands and approximately 962 isles, atolls and cays. The island chain extends over a distance of approximately 1,600 km with a total land area of 28,369 sq km and a sea area (Exclusive Economic Zone) of 1.34 million sq km.

The national capital, Honiara, is located on the island of Guadalcanal. The nation is divided into eight provinces: (from west to east) Choiseul, Western, Isabel, Central, Guadalcanal, Malaita, Makira and Temotu.

Many of the islands are of recent volcanic origin. The larger islands are rugged and mountainous with rainforest vegetation while the smallest are bare, coral atolls and sand cays. The islands contain a diversity of landforms and life forms and all have their own individual beauty.

Solomon Islands is part of the Pacific "Ring of Fire", an area of volcanic activity arising from the convergence of the Pacific and Australian tectonic plates.

The climate encourages the growth of beautiful, lush rainforests. (photo: SPREP)

2.2 Climate *(SOE 1.3)*

The climate of Solomon Islands is typical of many tropical islands. Coastal temperatures range from 22°C to an average maximum of 31°C throughout the year, with a pleasant ameliorating effect of seabreezes. Morning relative humidities regularly reach 90 per cent. The mean annual rainfall generally ranges from 3,000 to 5,000 mm, varying with topography, latitude and island orientation to the prevailing winds. The south-east areas of most larger islands (facing the trade winds) tend to have more rain from May through October, with drier weather on the lee side.

The north-west monsoon period from November through April brings heavy rain and cyclones. The cyclonic winds can completely defoliate large areas of forest and together with torrential rain can, on occasion, cause considerable property damage and loss of life. Most of these cyclones, however, are generated in the Solomon Islands area; because of their early stage of formation, they have relatively minor effect.

2.3 Land resources

2.3.1 *Water*

Rivers and streams are numerous on all of the larger islands as well as on many smaller ones. In the villages, water quality varies with rainfall incidence and intensity and particularly with the level of natural or human disturbance of the catchment areas. In Honiara itself, where there has been a rapid population growth, the available supply of water tapped from surface and underground aquifer sources is inadequate to meet both urban domestic demand and the water needs of proposed new industries, such as a brewery. Although surface and groundwater resources are abundant in Honiara, these need to be more fully developed and existing leakages minimised.

2.3.2 *Soils (SOE 2.1.6)*

Twenty-seven groups of soils have been mapped by Hansell and Wall (1976) and Wall et al. (1979). The most agriculturally important soils are the recent alluvials found only on the north Guadalcanal plains; they are the most fertile of all Solomon Islands soils.

As a whole, the soils of Solomon Islands are rich in nitrogen, phosphorous and organic carbon, but relatively poor in potassium and magnesium. Phosphorous is most abundant in soils on limestone and least abundant in those on basic and ultrabasic rocks. Organic matter is an important component in the topsoil where the bulk of the soil nutrients are held. Generally, the soils have good structure, are well drained and usually deep.

2.3.3 ***Minerals*** *(SOE 2.1.3)*

The only known mineral deposits in Solomon Islands likely to be of economic potential are gold, nickel and bauxite. Gold has long been known in veins in the Gold Ridge volcanics of central Guadalcanal. A feasibility study and an environmental impact statement have been completed for this prospect and are currently under independent review; negotiations with landowners are still proceeding. The only deposit currently being worked is alluvial gold in the Chovohio River which drains Gold Ridge. Moderately large amounts of low-grade nickel have been reported from eastern San Jorge, Jejevo and Tataka in southern Isabel. Open-cut mining has been proposed for the San Jorge and Tataka deposits. The bauxite clays formed on upraised reef limestones of west Rennell, Waghena, Santa Cruz, and Munda in New Georgia are the most likely to be economic. Mining was proposed on Rennell in the 1970s, but the venture did not proceed due to failure of negotiations with landowners, environmental concerns, the low price of aluminium on world markets, and technical difficulties with the extraction of aluminium from the bauxite.

Construction materials *(SOE 2.1.4)*

Limestones of the Wairokai district of Malaita are considered suitable for use in cement manufacture. Volcanic ash deposits which could be used for the production of highly resistant cement occur on western Guadalcanal, Gizo and Choiseul. Some gravels and sands are extracted near Honiara for local construction purposes and recent reef limestones are used for subgrade on roads and airstrips. Currently, there are proposals to extract reef rubble from beaches for use in aquaria.

Hydrocarbons *(SOE 2.1.5)*

Although onshore oil exploration began in Central Guadalcanal in early 1960, no commercial fields have been identified. Offshore, seismic exploration of about 25,000 km of sea bed has indicated that five areas have good potential, but further work is required before a full evaluation can be made. The government is keen to encourage further exploration, but no companies have yet shown interest.

2.3.4 ***Flora*** *(SOE 2.2)*

The land in Solomon Islands is still dominated by tropical forest and woody vegetation. In 1972, of the total area of 28,000 sq km, up to 25,000 sq km was covered by forests and woody vegetation. The current forested area is, however, largely unknown because of extensive clearing for gardens, logging, and cyclone damage since that time.

There have been spasmodic efforts to describe the flora of Solomon Islands and botanical knowledge is far from complete. A map was produced of major vegetation formations in 1976, based on aerial photograph interpretation, but this is now grossly out of date, with much land clearing and several cyclones having occurred in the interval. The national herbarium in Honiara holds about 30,000 specimens, mostly of vascular plants, with tree flora better represented than other groups. The SOE reports a listing in Henderson and Hancock (1988) of 3,210 species of vascular plants, representing 1,077 genera and 205 families, but Leary (1991b) also indicates there are a large number of synonyms and mis-identifications.

Solomon Islands flora has strongest affinities with that of Malesia (the area including Papua New Guinea, Malaysia, Indonesia and Philippines), but has fewer families, fewer genera and fewer species because it is geologically recent and was never linked by land to any other continent. Compared with fauna, there is a low level of plant endemism (found only in Solomon Islands). There are no endemic families recorded and only three endemic genera. At the species level, endemism appears highly variable between families; this is illustrated in Table 2.1.

Table 2.1 **Percentage of endemic plants in some well-known genera & groups**

Genus or group	*Total no. of species*	*No. of endemic species*	*Percentage %*
Freycinetia	20	16	80 [1]
Boerlagiodendron	7	5	71 [1]
Palms	33	19	58 [2]
Orchids	277	28	10 [3]
Canarium	7	0	0 [4]
Barringtonia	5	0	0 [5]
Cyrtandra	11	7	64 [6]
Eleocarpaceae	14	4	29 [7]
Terminalia	14	2	14 [8]
Ferns	340	34	10 [9]

[1] Whitmore 1969
[2] Dowe et al 1989
[3] Lewis & Cribb 1991
[4] Leehouts 1959
[5] Payens 1967
[6] Gillett 1975
[7] Coode 1981
[8] Coode 1978
[9] D. Glenny pers. comm. to T. Leary

Source *Solomon Islands State of the Environment Report*, Table 1 (Leary 1991b).

Of the five Melanesian countries, the literature reports Solomon Islands as ranking third in its degree of endemism to Papua New Guinea and New Caledonia, followed by Fiji and Vanuatu. However, such views are to a certain extent conjectural because of the limited knowledge of the flora of Solomon Islands.

A major constraint to environmental planning for forestry and agriculture is the lack of recent information on vegetation communities; this also severely limits understanding of habitat preferences of fauna. The primary lowland rainforest is considered to contain fewer large tree species than west Malesia, with irregular canopies varying between 30–40 m in height; climbers and epiphytes are more abundant. In 1976 there were about 650 sq km of mangroves and a further 970 sq km of swamp forests although these data may well now be over-estimates due to clearing. There are extensive areas of grasslands in the northern plains and foothills of Guadalcanal and in the Nggela islands (about 147 sq km); these are believed to be human-induced and maintained through frequent burning. Crops and bush-fallow in 1978 constituted about 2,500–3,000 sq km.

There has been no assessment of rare or endangered plant species in Solomon Islands. There has likewise been no assessment of the impacts of introduced plants, some of which have spread aggressively following disturbance of natural forest.

2.3.5 *Fauna* (SOE 2.3)

Of the native fauna of Solomon Islands, birds have been the most closely studied group with island distribution relatively well known; however, much remains unknown on the ecology and status of many bird species. Next to birds, reptiles have been the second most studied group; much of this work, however, was confined to coastal areas or to one or two islands. Species occurrence on individual islands is fairly well known, but there is little information on the altitudinal distribution or ecology of many species. Mammals have received comparatively little attention and current scientific knowledge is patchy at best; most work has been confined to taxonomy. But the least studied animal group of all is frogs, with little systematic surveying and most collection activity being *ad hoc*. There is no estimate of the total number of invertebrate species and many remain undescribed; most studies have concentrated on commercial pests, particularly those of coconut, cocoa and taro.

Some flowers are unique to Solomon Islands but few have been described. (photo: SPREP)

Apart from native animals, there are a variety of introduced animals, some prehistoric and some of recent event.

***Birds** (SOE 2.3.1)*

Solomon Islands has the most diverse avifauna of all the Pacific Islands (excluding PNG) with more than twice the number of bird species of any other Pacific Island country. It has approximately 173 species of land birds which breed in Solomon Islands and about another 50 species of sea birds, shore birds or birds which are occasional visitors or migrants.

Not only is there a high diversity of birds, but Solomon Islands also has a high level of endemism (i.e. birds unique to Solomon Islands). Diamond (1976) estimated that only 18 per cent of Solomon Islands birds are identical to birds living elsewhere in the world, and, as such, there is no other place known in the world, not even the Galapagos Islands, where the biological phenomena of speciation and population variation among birds are so obvious.

There are 18 species of birds which are considered threatened on the checklist of the International Council for Bird Preservation (ICBP) and a review has proposed the addition of a further two Solomon Islands bird species to the rare and endangered list. A further three species are included on a checklist of near-threatened species. Local studies indicate that

An endemic bird species — Sandfords white-eye Woodfordia lacertosa. *This bird is only found on Nendo or Santa Cruz in Temotu Province. (photo: T. Leary)*

Pied Monarch fledglings Monarcha barbata. *Solomon Islands has endemic subspecies. (photo: T. Leary)*

One of the endemic giant rats of Solomon Islands. This rat, Solomys ponceleti, *is only found on Choiseul. (photo: T. Leary)*

two species are almost definitely extinct, but a further seven species may also be extinct. A further four are considered endangered, threatened or vulnerable, and according to Schodde (1979) a total of 102 forms (mostly at subspecies level) should be considered rare.

Reptiles *(SOE 2.3.3)*

The total known number of terrestrial reptiles (excluding sea snakes, turtles and crocodiles) is 61. There is a greater diversity of reptiles than elsewhere in the Pacific Islands, although endemism may be higher in New Caledonia. There are three known endemic reptile genera in Solomon Islands and 25 endemic species. At least five species appear to be endangered or possibly extinct; they are known from few collections or have not been collected since 1930.

Mammals *(SOE 2.3.2)*

While recent collection programmes have considerably improved the knowledge of taxonomy and island distribution of mammals, very little is still known of habitat requirements and ecology of most species. Systematic surveys are urgently required of the major habitat types as well as ecological studies on species considered rare or endangered. There are 52 species of native mammals, predominantly flying foxes (26), insectivorous bats (18) and rats (8). Fifty per cent of species are endemic and represent one of the world's richest areas of diversity of Pteropid flying foxes and giant rats.

Three species of giant rats, thirteen species of flying foxes, and four species of insectivorous bat are vulnerable or endangered (i.e. in danger of extinction if no action is taken) due to their limited distribution (i.e. on one or few islands) and habitat changes which are occurring throughout the islands. Three species of giant rats and one species of flying foxes are either extinct or close to extinction. The status of at least 24 of the 52 species of native mammal is not secure.

Frogs *(SOE 2.3.5)*

Seventeen species of indigenous frogs are listed for Solomon Islands; this is the greatest diversity of frogs of any Pacific Island group. There are three endemic genera (includes Bougainville). Information on the distribution, status and ecology of Solomon Islands frogs is so poor that it is almost impossible to assess their status. Virtually nothing is known of the ecology of most frog species in Solomon Islands.

Invertebrates *(SOE 2.3.5)*

It is believed that there are about 130 species of butterflies in Solomon Islands of which 35 are endemic and a further 54 are shared with Papua New Guinea. These species include a large number of beautiful and spectacular butterflies including the very large birdwing butterflies. Species considered rare in the IUCN Red Data Book include the sword-tail butterflies *Graphium meeki* and *Graphium mendana*, and the swallow-tail butterfly *Papilio toboroi* (Dahl 1986).

Some of the 130 species of butterflies found in Solomon Islands. (photo: SPREP)

One of the spectacular birdwing butterflies, this is a male Queen Victoria Birdwing butterfly Ornithoptera victoria. *(photo: T. Leary)*

Introduced animals *(SOE 2.3.6)*

Prehistoric introductions of animals are believed to have included the pig, the spiny rat (*Rattus exulans*) and the marsupial cuscus (*Phalanger orientalis*). More recent introductions include feral cats (*Felis catus*), the black rat (*Rattus rattus*), the brown rat (*Rattus norvegicus*), and the house mouse (*Mus musculus*).

Introduced reptiles include two species of geckos (*Gehyra mutilata* and *Hemidactylus frenatus*) which are generally confined to human habitation, and a species of blind snake (*Ramphotyphlops bramina*). The only introduced frog is the common and widespread marine toad (or cane toad) (*Bufo marinus*). There appear to be only two species of introduced birds with wild breeding populations: the Indian myna (*Acridotheres tristis*) and domestic fowls (*Gallus* sp.) (reported to have wild breeding populations in the Santa Cruz group).

Species which may constitute a threat to native fauna include the marine toad, the feral cat and the black rat. Such species are a more subtle and often under-rated threat to island fauna, either directly through predation on native fauna or by their toxicity to native fauna, or indirectly by competition for resources. Recent survey work in Solomon Islands has raised concern at the spread of these three species in particular and their potential impact on native fauna populations.

2.4 Marine resources *(SOE 3.0)*

Solomon Islanders consume about 34 kg/person/year of seafood and are clearly heavily dependent on the subsistence catch, primarily from the reefs and lagoons. The nation is also heavily dependent on the revenue derived from commercial fishing operations, particularly the catch of skipjack and yellowfin tuna by the domestic fleet, and to a lesser degree from licences to foreign deep-water fishing nations for access to the Solomon Islands 200-mile EEZ. Solomon Islands now has the largest domestic tuna fleet of the Pacific Island countries and has largely closed its waters to foreign fishing fleets.

2.4.1 *Mangroves & seagrass beds*

Solomon Islands has extensive areas of mangroves, estimated in 1976 at 642 sq km in total, but there is no recent information on distribution and condition of stands. There is also little information on the fish of the mangroves. A recent survey of 13 estuaries (Blaber & Milton 1990) found the role of the mangroves as nurseries for coral reef species was insignificant, although they were considered to be important feeding grounds for many other species. The mangroves have not been exploited on an industrial scale but continue to provide communities with house construction material, firewood and other community needs.

Seagrass beds are believed to be important feeding grounds for dugongs and turtles but there are little available scientific data to indicate the extent or importance of seagrass beds.

2.4.2 *Inshore fishery*

Coral reefs are of major importance to many coastal dwellers, not just for subsistence needs but as cash-earning opportunities for a growing number of artisanal fishermen entering the fishery. Total domestic catch of reef fish (more than 180 species) is not known; about 70 tonnes per year are sold locally.

The inshore fishery is also a continuing scene of commercial activity, with trochus shell the most important non-finfish resource in terms of export earnings (about $SI 4.5 million in 1989). Bêche-de-mer continues to be harvested in a small way and processed locally for export. There has been no national assessment of bêche-de-mer stocks but there are indications, at least in Ontong Java where fishermen are probably the largest producers, that the bêche-de-mer population is being affected by fishing pressure

Hawksbill turtles are declining in numbers, most likely as a result of turtle shell export. (photo: WWF)

with a decrease in size of preferred species and fewer numbers being reported. Three commercially important species of pearl shell continue to be harvested: goldlip pearl oyster (*Pinctada maxima*) is believed to have been systematically over-harvested, but the blacklip pearl oyster (*Pinctada margaritifera*) may be under most pressure due to its accessibility to free-divers. Green snail is also harvested by artisan fishermen for sale and export; there are indications that stocks are being over-exploited to take advantage of current high prices. Several species of lobster occur and have been exploited on a small scale by joint foreign/Solomon Island Government (SIG) ventures.

Green turtles (*Chelonia mydas*) and hawksbill turtles (*Eretmochelys imbricata*) nest in small numbers on many beaches throughout Solomon Islands. Green turtles are important both as a resource for food and culturally for many coastal people, and there is a small local trade in meat. Hawksbill turtle populations are believed to have declined significantly since 1980 (Leary 1990b), most likely as a result of turtle shell export (3.4 tonnes in 1989) (Leary 1990a). While the nests of leatherback turtles (*Dermochelys coriacea*) continue to be harvested for their eggs (despite legal prohibitions), Leary (1990b) reports increases in numbers of leatherback turtles nesting in Western (including Choiseul) and Isabel Provinces. The loggerhead turtle (*Caretta caretta*) and the Olive Ridley turtle (*Lepidochelys olivacea*) are also found in Solomon Islands waters, but are very rare.

A recent survey by Messel and King (1989) found that the salt-water crocodile (*Crocodylus porosus*) was nearly locally extinct as a result of over-exploitation for the skin trade. The SIG is considering a number of restrictive measures to protect the species.

Because of concern at the level of over-exploitation of the coconut crab (*Birgus latro*), the government imposed a moratorium on exports, but this is being circumvented.

2.4.3 *Offshore fishery*

The tuna fishing industry is a major revenue earner for Solomon Islands. Catches of skipjack and yellowfin tuna have been in the order of 40,000 tonnes per year, although the 1990 harvest was only 29,500 tonnes, partly attributed to climatic reasons, smaller fish size and fishing equipment problems. There is some fishing activity in shallower waters (to 60 m) but very little exploitation yet of known commercially attractive deep-bottom snapper resources.

2.5 **The people** *(SOE 5.1)*

The current population is estimated at around 330,000 (1991). The last census was taken in 1986, when the population was estimated at 285,176. The rate of population growth over the period 1976–1986 averaged 3.5 per cent per year, among the highest of the region's (and world's) natural growth rates. It is exceeded in the Pacific, for example, by Wallis and Futuna with 5.0 per cent and the Republic of the Marshall Islands with 4.2 per cent. If the current growth rate is maintained, the population will double in 20 years.

Most of the people live in rural areas in small settlements and villages along the coastal fringe, average

Table 2.2 **Estimated population distribution in Solomon Islands in 1991**

Province	*Estimated population*	*Per cent*	*Density distribution per sq km*
		%	
Western	64,716	20	7.0
Isabel	16,564	5	4.0
Central	20,997	6	16.3
Guadalcanal excluding Honiara	60,746	19	11.4
Honiara	37,451	11	1702.3
Malaita	86,491	26	20.5
Makira	25,235	8	7.9
Temotu	16,495	5	19.0
Total	**328,695**	**100**	**av. 11.6**

Source Statistics Office, Honiara, and Leary (1991b, 5.1).

village size being about 44 people. But there is an increasing rate of migration to Honiara where 11 per cent of the country's population now live. While the average population density for Solomon Islands at 11.6 inhabitants per sq km is low, above average densities are found in Central, Malaita and Temotu Provinces. Such averages can be misleading because they are not expressed as a percentage of the available arable land; they also mask some critical areas of high population density on small islands, notably Reef Islands with 177 inhabitants per sq km and Tikopia which has 1,166 people living on an area of four square kilometres (equivalent to 292 per sq km). It is on such islands, in particular, that pressure on limited land resources is more likely to cause severe environmental problems.

As would be expected with the high natural growth rate, the population is young with 47 per cent under 20 years of age. Literacy is low overall, with 40 per cent never having attended school; only 9 per cent have had at least one year of secondary education, with one per cent of the population educated beyond the secondary level. Leary (1991b) reports that even this one per cent tertiary figure is considered an over-estimate because of the number of non-Solomon Islanders enumerated in the census.

At the time of the 1986 census, 86 per cent of the population aged 14 years and over were regarded as being "economically active", where that term is defined as including those who participate in unpaid work in addition to those engaged in the cash economy. Most of the economically active are engaged in the subsistence economy, only some 8.3 per cent being wage and salary earners.

Of the latter, 64 per cent are employed in the private sector, 32 per cent in national government and four per cent in provincial government. The annual wage for employed workers averages about $SI 8,500 in Honiara, and $SI 6,200 for the country as a whole.

2.5.1 *Culture, history & government* (SOE 4.0)

Solomon Islanders are predominantly Melanesian (94.2 per cent), with 3.7 per cent Polynesian, 1.4 per cent Micronesian (mostly Gilbertese resettled by the former British administration from Banaba in Kiribati), with the remainder comprising mainly people of Chinese or Caucasian descent. The culture is quite diverse, evidenced by the more than 65 languages known to be spoken in the country. The culture (custom) is still strongly adhered to in most areas, although some traditional knowledge is waning and there is a reported decline in traditional authority in some areas.

Traditional values, beliefs, legends and genealogies have been passed on orally from generation to generation for very many years. For how long? No one knows for certain, but archaeological evidence suggests some 6,000 years of human settlement in Solomon Islands.

Recent history of Solomon Islands saw Britain declaring a Protectorate in 1893, military occupation by Japan in 1942–1943, and then a process from 1960, when a Legislative Council and Executive Council were formed, to July 1978 when Solomon Islands became an independent nation within the Commonwealth of Nations. It inherited from the United Kingdom administration an economy with minimal infrastructure, a very large public sector and very little human resources development.

Solomon Islands has a three-tier government of a unicameral National Legislative Assembly of 38 elected members, eight Provincial Governments (Western, Choiseul, Isabel, Central, Malaita, Guadalcanal, Makira, Temotu), and Area Councils. A gradual process of devolution of functions and responsibilities to the provinces is continuing.

2.6 Economic development *(SOE 5.2, 5.3)*

The growth in economic activity has not kept pace with population growth. With both inflation and the population increase taken into account, there was a significant fall in real income per head in 1989–1990. The agriculture sector continues to make the largest, but declining, contribution to GDP (about 36 per cent), with forestry and fishing contributing around 11 per cent. The manufacturing sector is small but contributes 4 per cent. For some years, fish and fish products have been the highest valued export commodities, with logs and timber in second place. In 1990 the position was reversed, but this may be only a temporary trend as fish catches were well down. At the same time, new large logging operations in Choiseul and New Georgia significantly boosted log exports.

The rate of increase in imports continues to outstrip exports, the overall balance of payments for 1990 being in deficit by almost $SI 68 million, the widening accumulated external debt now grossing $SI 414 million, with an annual cost of debt servicing of $SI 20 million.

Government expenditure averages about 35 per cent of GDP, with the subsistence sector contributing 30–40 per cent of GDP. Economic activity aimed at producing goods and services accounts for about 25 per cent of GDP and is a narrow base from which to generate economic growth.

Most exports are natural resources with little value-added processing — copra, palm oil, cocoa, timber and fish. Almost all manufactured items are imported, with machinery, equipment, fuel and lubricant accounting for almost 50 per cent of all imports. Imported food items account for a further 15 per cent.

The nation is heavily dependent on foreign aid — about $SI 88 million in 1990, or 25 per cent of GDP. The United Kingdom has traditionally been the main source of aid for both capital expenditure and budgetary support; however, budgetary support has declined substantially and foreign aid has diversified to include the European Community, World Bank, Asian Development Bank, Australia, New Zealand, Japan, United States of America, People's Republic of China, and a number of regional, international and United Nations agencies.











part I

Environmental action strategies & programmes

With the publication of the World Conservation Strategy in 1980 came the clear message that conservation must not be regarded as being opposed to development — without due regard to conservation, development can only be short term, it cannot be sustained. With the growing recognition of this fact, the phrase "sustainable development" has become common usage over the past decade.

But "sustainable development" seems capable of being interpreted in a wide variety of ways. In *Caring for the Earth. A Strategy for Sustainable Living* (IUCN/UNEP/WWF 1991), the definition of the Second World Conservation Strategy Project is used:

> *The use of an organism, ecosystem or other renewable resource at a rate within its capacity for renewal.*

Or, expressing the same concept in a more general way:

> *Improving the quality of human life while living within the carrying capacity of supporting ecosystems.*

In other words, sustainable development is really all about survival in the long term. In that sense, the old subsistence village life is sustainable development, something at which Solomon Islanders have been expert for thousands of years. The idea of sustainable development, then, is nothing new to Solomon Islands; but more than survival, Solomon Islanders want a satisfactory life for themselves and their descendants, with improved standards of living. New types of economic development are required for that goal to be achieved, and to maintain it new ways must be learned for resource use and management to ensure the economic gains made are sustained.

The following strategies and programmes are directed towards the target of sustainable development.

Integrating environmental considerations in economic development

It is clear that the key to sustainability of resource use and the achievement of environmental conservation is the integration of environmental safeguards in economic decision-making. This is a complex task, which needs to be addressed at all levels, from the national policy level through to the local level. There are a number of practical steps that can be taken immediately on a national level to ensure that sustainable development is introduced.

To achieve long-term economic and environmental viability, some comprehensive institutional and legal changes need to be made. These include the introduction of integrated mechanisms for the generation of economic and environmental policy, and the enactment of legislation at a national and provincial level to ensure that policies can be carried out within a consistent and enforceable legal framework.

Solomon Islands needs faster economic growth for long enough to secure satisfactory living standards. Broad policies to support such economic need would conceivably include the following (adopted from *Caring for the Earth*, IUCN/UNEP/WWF 1991, pp. 21–22):

- an overall strategy for sustainability;
- the opening of national and international markets so market systems can work efficiently and a reasonable rate of return can be obtained from sale of produce;
- 15–20 per cent of GDP invested in future skills;
- allocation of more resources to rural areas to reduce rural–urban disparities;
- encouragement of greater use of health and educational facilities;
- action to ensure that decisions about priorities and resource allocations are made locally;
- action and investment to improve the institutional and regulatory framework for environmental management;

- action to ensure that women are enabled to play a full part in the process of national development;
- provision of greater opportunities for productive employment to raise incomes and spread the benefits throughout the population. More industrialisation is urgently needed, but must be done in ways that safeguard the environment;
- action to promote private initiative, encourage the growth of the private sector, and the development of small- and medium-sized enterprises;
- action to promote foreign investment, including the transfer of technology which will allow environmentally sound industrialisation;
- action to help people undertake their own development through, for example, participation in other development decisions, vocational training, other skill development, and particularly the granting of credit to the cash poor;
- monitoring the state of the environment to provide a basis for continuing adaptation of policy.

Solomon Islands Government is already actively addressing many of these policy elements for sustainable development; the challenge of others has yet to be taken up. Main policy elements can be expressed as five broad strategies for proper environment management:

3.1 Adopt an integrated approach to environmental policy and planning.

3.2 Submit proposed policies, development programmes and projects (government and private, local and foreign), to environmental impact assessment.

3.3 Introduce a comprehensive framework of national and provincial environmental law, together with the means for its enforcement in a communally acceptable manner.

3.4 Review adequacy of institutional mechanisms and administrative controls and strengthen them as necessary.

3.5 Institute resource pricing in the National Accounts and other economic policy for achieving sustainability.

Solomon Islands Government actively addressing issues of sustainable development at the United Nations Conference on Environment and Development. By signing the Conventions on climate change and biodiversity Solomon Islands has committed itself to take action. (photo: C. Appleton)

These strategies are elaborated below.

3.1 Adopt an integrated approach to environmental policy & planning

Economic and environmental considerations must be integrated if a society is to be sustainable. Towards that end, it is important for government to ensure an effective, integrated national approach and provide a national and provincial framework of institutions, economic policies, laws and regulations, and an information base. An early area of consideration for the National Government is how to integrate, both insti-

tutionally and procedurally, its policy evaluation, economic planning, physical planning, environmental protection and sectoral development programming activity. Detailed institutional and procedural discussion is beyond the scope of this NEMS, but it is appropriate here to make some broad observations.

Throughout the world, over the past 20 years or so, many different models of administrative departments and institutions concerned with environment have been established. In Solomon Islands the Environment and Conservation Division (ECD) is the prime body charged by the National Government with environmental administration, but it has a limited mandate, inadequate staffing and inadequate budget. The ECD was added to an existing bureaucracy (Ministry of Natural Resources) within which its severe staffing and financial constraints have forced it to be reactive, responding to problems after they have developed, rather than pro-active. It has limited ability to co-ordinate environmental management concerns with economic development decision-making processes.

Physical planning is central to environmental management. But, while the Physical Planning Unit would appear on the surface to be well placed within the Ministry of Agriculture and Lands, physical planning activity is confined under the Town and Country Planning Act only to alienated land — in effect the principal urban centres. Thus the principles of physical planning are not yet applied to the bulk of the land resource of Solomon Islands. There is a need to determine how the science of physical planning could be better used to assist landowners, villages and Area Councils, and how it could be better integrated at the national level with other economic and environment planning, thus assisting the process of rational policy formulation and evaluation.

The importance placed by national and provincial governments on the physical planning process is seen in their support for a Diploma of Physical Planning, developed jointly by Solomon Islands College of Higher Education (SICHE) and the Physical Planning Unit, from which 22 students graduated over the 1990-1991 period. The curriculum for this course had a strong environmental emphasis and, with experience, the graduates will inevitably play a central role in environmental planning and assessment, particularly in the provinces.

Economic policy can be an effective instrument for promoting environmental protection and ensuring that the principle of sustainable use of natural resources is followed. The Solomon Islands domestic economy depends on the environment not just for raw materials but to support life itself. The old models of economic planning which many countries are still using (including Solomon Islands) do not take the full value of natural resources and services into account. New models being developed take into account the depletion of goods, including natural resources, and the decline in the support services of the environment. Such model development would fall within the mandate of the Economic Planning Unit in the Ministry of Finance and Economic Planning.

But the immediate concern is to ensure that development proposals are subject equally to environmental as well as economic and financial appraisal. Just as economic assessment is a routine aspect of project appraisal, so should environmental examination be both routine and of equal status with economic assessment. Indeed, an economic appraisal is deficient in the absence of environmental appraisal.

Policy evaluation must therefore be combination of economic and environmental consideration together with the many other factors which govern policy formulation and application. The mandate for this function rests with the Policy Evaluation Unit of the Office of the Prime Minister.

Taking the principles of integration of environment and economic planning to the highest levels of government, the implementation of this strategy could entail the following:

- formal adoption of the principle of

sustainability, with integration of environment and economic considerations built into the terms of reference of Cabinet and of government committees dealing with national economic policy and planning, and with key sectoral policies;

- the formation of a unit or body within National Government which integrates economic, environmental and physical planning with the policy evaluation process, and has the mandate to examine departmental policy and development or investment proposals before they go to Cabinet;
- the units with specific responsibility for the above mentioned functions are currently located within four separate ministries. Were these units given equal status and physically located together within the Office of the Prime Minister, a clear signal would be given both internally and externally of the importance attached by the Prime Minister to the sustainable development principle;
- incorporation of the principle of sustainable development into the mandates and policies of the sectoral line ministries;
- upgrading the capacity to assess the environmental impacts of proposed programmes and projects and to analyse environmental implications of policy and public investment;
- promotion of common approaches to economic and environmental planning across provinces; and
- promotion of open consultation mechanisms with all areas of the Solomon Islands community and the pursuit of traditional consensus approaches to decision-making.

3.2 Submit proposed policies, development programmes & projects (government & private, local & foreign), to environmental impact assessment (EIA)

EIA is used to predict the likely economic, social, cultural and biological consequences of a proposed activity (i.e. the effect on the environment). EIA is a very important planning tool for government. It helps identify potential problems and hence aids planning to prevent adverse impacts, or to reduce them to acceptable levels, before investment is committed.

A full EIA is applied only to those development projects which a preliminary screening indicates are likely to have major economic, social, cultural or biological impacts. But all development projects — public and private, foreign and local — must be subjected to that initial screening process. The size of the economic investment in a development proposal is no criterion for the potential magnitude of the environmental impact. For all projects which are likely to have a significant environmental impact and are allowed to go ahead:

1) an environmental management programme should be included in the project design document; and
2) the capacity for proper monitoring should be assured (from either internal or external sources), to compare reality with the predicted effects and thus permit adjustment of the planned development process.

EIA should always be undertaken early in the project cycle. For development assistance agencies EIA should begin right from the country programming mission stage and continue through pre-feasibility and feasibility stages. Subsequently, annual programming mission teams from international agencies, such as the ADB and World Bank, should include a person experienced in environmental appraisal.

Programme

***3.2.1** Standard EIA guideline development for national & provincial governments*

see Appendix 1, page 96

The need for the development of EIA guidelines was very strongly advocated by the participants of the NEMS Seminar. The Ministry of Tourism and Aviation has already developed such guidelines for tourism developments. The Seminar also strongly supported a view that the principle of final acceptance or rejection of environmental impacts of development proposals rests with the Provincial Governments, not the National Government. Guidelines on their own are not enough; they must be accompanied by detailed administrative procedures for their implementation, and training of responsible officers in EIA.

EIA must extend beyond development projects to all national, provincial and sectoral programmes. Therefore, the institutional EIA capacity should be located at the central level of government, where development and sectoral policies, programmes and projects are evaluated. Wherever the channel for policy evaluation is located within government, that is where the environmental unit with its EIA capability should also be located.

3.3 Introduce a comprehensive framework of national & provincial environmental law, together with the means for its enforcement in a communally acceptable manner

In order to achieve harmony between environmental policy and economic decision-making at national and provincial levels, comprehensive and consistent legislation will need to be introduced. Such legislation should contain a set of clearly defined principles of sustainable use and conservation of the nation's natural and cultural resources. The Legal Review associated with the NEMS process indicates that it is possible to enact legislation which integrates much of the present resource management and conservation legislation within one statute. This strategy supports that approach. A compendium of environmental regulations, governed by a single set of broadly agreed principles, capable of implementation with some rearrangement of the present administrative mechanisms, seems to be the best way to achieve a harmonised approach to economic and environmental concerns.

The implementation of this strategy would entail the following elements:

- review of existing legislation of relevance to the environment (currently in progress);
- drafting of an umbrella national Environmental Act reflecting the role of provincial authorities;
- drafting of Provincial and Honiara Municipal Authority Ordinances; and
- establishing a new environmental administration structure.

3.4 Review adequacy of institutional mechanisms & administrative controls

During the preparation of the NEMS, a number of alternative options for environmental planning and

assessment were developed and administrative mechanisms considered. This followed consultation with the heads of key SIG divisions charged with the responsibility for planning or managing some aspects of the physical environment. The NEMS Seminar also addressed the concerns of a number of other government ministries or organisations, such as those charged with the administration of the social environment (e.g. health), and those dependent on both the social and physical environment (e.g. tourism).

These options are discussed briefly below. The development of these options was undertaken on the basis of the observations and principles discussed in the preceding sections of Chapter 3. The fundamental aim is to simplify and rationalise the environmental administrative process in a way that will foster sound development. As has been stated previously, sound development requires equal attention to economic, financial, social and environmental appraisal.

A fundamental consideration is the need for complementary administrative mechanisms between each level of government — National, Provincial and Area. These are developed in accord with the National Government's policy of maximum devolution to Provincial Governments of appropriate functions and responsibilities.

In effect, a three-tiered system for environmental planning and assessment would emerge. At the National level, environmental plans are broader, basic, national policy documents developed with substantial input from bodies such as the National Task Force on Environment and Sustainable Development (or its successor) and from other private and public sectors. At the Provincial level, more detail is inserted to provide a framework appropriate for the special geographical, social and cultural needs of that province. At the Area level, there is greater detail on the specific requirements of the Area and the individual villages. The thrust is that central (national) planning authorities would have minimal control over the precise details of the local planning process.

However, due to the current level of development of the general administrative capability of Provincial and Area government, any attempt to develop a formal system of planning and assessment within Area Councils at this time is considered premature.

3.4.1 *The National level*

The existing government functional areas of prime environmental importance are the Environment and Conservation Division (ECD), Ministry of Natural Resources; the Physical Planning Division of the Ministry of Agriculture and Lands; the Economic Planning Division of the Ministry of Finance and Economic Planning; and the Policy Evaluation Unit of the Office of the Prime Minister.

Options

The following four options are related. Option 1 is seen as an ultimate, longer term objective. Option 2 or Option 3 is preferred in the current circumstances, but this is a matter for government consideration. Option 4 is essentially the retention of the status quo and is seen as the least desired course of action.

Option 1

1) The formation of an Office of Sustainable Development as a corporate body under its own Act, responsible directly to the Prime Minister and Cabinet. This Authority would be formed from the elements of ECD (MNR), Economic Planning Unit (MFEP), Physical Planning (MAL), and Policy Evaluation Unit (OPM). The environmental functions would include Planning and Assessment (Physical Planning and Socio-environmental Assessment), Protection (cultural heritage, national parks and conservation areas and reserves, botany, wildlife [fauna]) and Environmental Education and Information.

It would be seen as the honest broker between two unacceptable extremes: development at all costs and total resource protection.

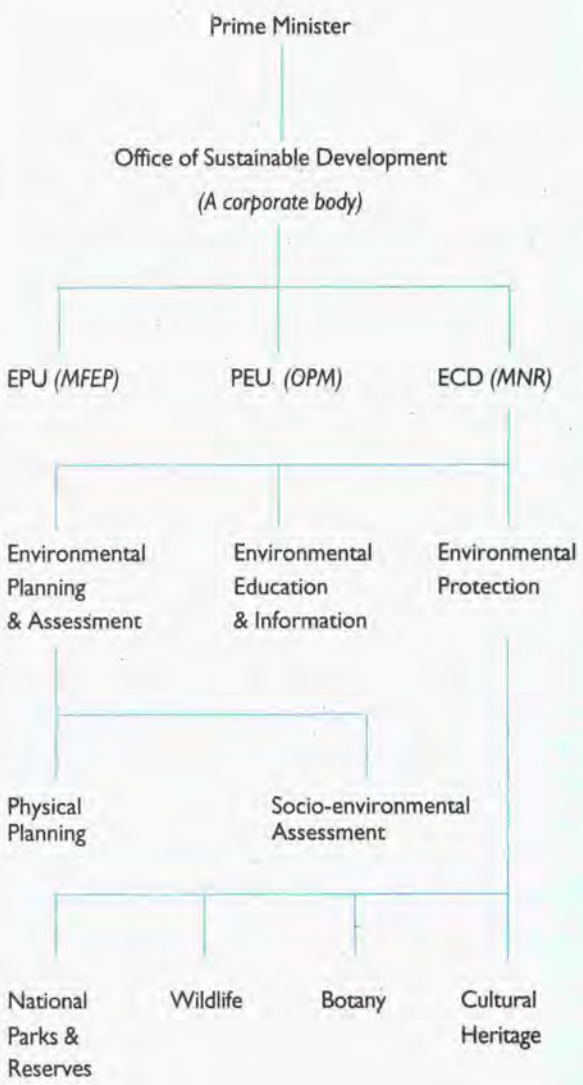
2) An alternative within Option 1 is the formation of a new Ministry of Environmental Planning and Protection (or Ministry for Sustainable Development). Such a Ministry would be formed from ECD (MNR), Physical Planning Division (MAL), Policy Evaluation Unit (OPM), Economic Planning (MFEP), with the possible formation of a soil and water pollution monitoring unit with transfer of laboratory facilities to a central government laboratory facility, and others as relevant.

Option 2

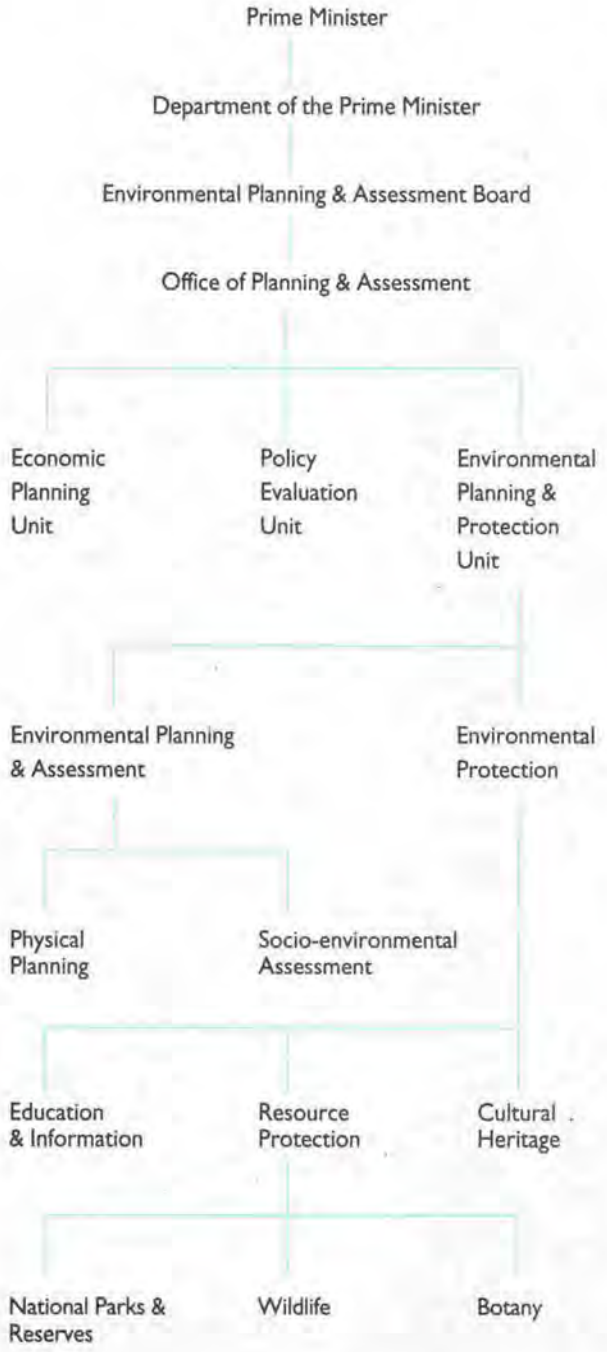
1) Incorporate the Town and Country Planning Act in a National Planning and Assessment Act (NPA) and establish under the NPA Act an Environmental Planning and Assessment Board (EPAB). This would be an advisory body to the Prime Minister, evolving from the current National Task Force and the Physical Planning Board (established under the Town and Country Planning Act).

2) Establish within the Department of the Prime Minister (DPM) (redesignated from Office of the Prime Minister) an Office of Planning and Assessment (OPA) headed by a Deputy Secretary of DPM. This Deputy Secretary would chair the EPAB.

3) Reconstitute (altered structure and staffing) and relocate the existing Environment and Conservation Division from MNR to OPA as an Environment Planning and Protection Unit (EPPU). The EPPU would have the environmental functions indicated in Option 1, that is, Environmental Planning and Assessment (Physical Planning and



Option 1 *The proposed Office of Sustainable Development as a corporate body responsible directly to the Prime Minister. The expanded planning, protection and environmental information roles of the ECD are shown.*



Option 2 *The proposed formation of an Office of Planning and Assessment within a Department of the Prime Minister, with the establishment of an advisory Environmental Planning and Assessment Board. This board would combine the roles of the existing National Task Force on Environment and Sustainable Development and the Physical Planning Board.*

Socio-environmental Assessment), Environmental Protection (cultural heritage, national parks and reserves, botany, wildlife), and Environmental Education and Information. It would also function as the secretariat to the EPAB with the Director of the EPPU serving as the EPAB's secretary or ex-officio member. A major role of the EPPU would be the implementation of SIG environmental policies and programmes through provincial governments. It is the Prime Minister's liaison point with provincial governments on all environmental matters, and should ensure co-ordination of planning and assessment activity across provinces.

4) Relocate the Physical Planning Unit from MAL to OPA as a division within the EPPU.

5) Relocate the Economic Planning Unit of MFEP back to the Department of the Prime Minister as a unit within the OPA.

6) Move the PM's existing Policy Evaluation Unit into OPA.

7) The heads of the three units of the OPA (PEU, EPU and EPPU) would all operate at the same administrative level (Under-Secretary); that is, they are accorded the same status, all being fingers of the one hand for sustainable development. Placing the EPPU within the DPM and at a status not less than that of EPU will send a clear signal, both internally and externally, of the importance attached to sustainable development.

Option 2 alternative

8) Relocate the Physical Planning Unit to the OPA as a fourth unit rather than incorporate it into the EPPU.

The units of the OPA should ideally be physically located together to place no obstacle in the path of full consultation between all units on the appraisal of development proposals and the rapid movement of paperwork. Such physical integration may not be possible in the short term due to the shortage of office space.

Option 3

As for Option 2, but without the formation of an Environmental Planning and Assessment Board. All planning and assessment functions would still be brought together directly under the Department of the Prime Minister, but not co-ordinated through an Office of Planning and Assessment. The EPPU would provide a co-ordination and liaison function with provincial governments and have a small core of professional staff with environmental expertise, with which it could undertake necessary research and management functions for environmental protection. It would have a limited capacity within its own resources to conduct socio-environmental assessments or assist the provinces with such assessments; in lieu of staffing capability, the EPPU would need the financial capacity to engage overseas specialists and advisers for specific tasks through organisations such as SPREP.

Option 4

The Environment and Conservation Division remains with MNR, with some increases in staff to handle vital planning, protection and education roles. This is the least desired option because the Ministry has as its main role the utilisation of natural resources, but without any specific responsibility for economic concerns.

The Permanent Secretary of MNR is placed in an invidious position, being asked to be both advocate and judge on environmental concerns associated with natural resource development activity. It is widely believed to be advantageous to government for proponents of development proposals, particularly foreign-based investment proposals, to deal with an environmental agency which is entirely divorced from specific sectoral interests.

Environmental Planning & Assessment Board (EPAB)

Proposed functions

- Advise on environmental policy and long-term strategic plans for sustainable development;
- Advise the Prime Minister on the efficient and effective implementation of environmental policies and strategies;
- Advise on national policy related to the conservation and preservation of cultural and natural resources — including environmental planning, socio-environmental assessment, pollution control, and national heritage conservation — and ensure that all policies are consistent with the National Environmental Management Strategy as approved by Government from time to time;
- Monitor environmental regulatory and enforcement policies and make available guidelines relating to the institution of criminal and related procedures for public information;
- Oversee, on a collaborative basis, the formulation of policy and programmes of line ministries relating to environmental matters, and advise, promote and assist in the implementation of programmes and policies;
- Monitor the progress and effectiveness of programmes related to the conservation of

natural and cultural resources and provide advice to line ministries on their activities related to environmental planning and protection;

- Advise on resolution of controversy relating to the conservation and development of natural and cultural resources;
- Advise the Prime Minister on any matter relating to the Board's functions and responsibilities;
- At the direction of the Prime Minister, establish and appoint working groups to perform specific tasks and dissolve any such working group;
- Conduct such other tasks as given to the Board by the Prime Minister from time to time relating to environmental matters; and
- Do such things and perform such other tasks as the Board determines are necessary for the proper discharge of its functions.

Proposed EPAB membership

Each member would be appointed by the Prime Minister for a specified period, with the aim of broad representation from both public and private sectors, including non-governmental organisations. The following representation of fields is suggested:

- Office of Planning and Assessment (Chairman);
- Ministry of Agriculture and Lands;
- Ministry of Education and Human Resources Development;
- Ministry of Natural Resources;
- Ministry of Provincial Government;
- a representative of Churches
- a representative of an environmentally concerned NGO;
- a representative of private industry/commerce;
- Environmental Planning and Protection Unit (Secretary to EPAB).

In addition, when environmental planning or assessment issues relating to major development projects in a province are to be considered by EPAB, then Board representation would also include:

- a representative of the Provincial Government concerned; and
- a representative of landowners.

It is unlikely that the EPAB would need to meet formally more than four times a year. The creation of an Executive Group within the EPAB in order to expedite interim activity should be considered.

EPAB working groups

There would be a need from time to time to establish *ad hoc* working groups (WGs) to tackle specific technical or planning tasks. The WGs would comprise specialists drawn from relevant line ministries or organisations, educational and research institutions or other sources. The early establishment of the following WGs is needed: Environmental Education WG; Pollution Control and Standards WG; and Environmental Law WG.

The WGs would have a two-fold role. They would:

1) provide a technical advisory service to the EPAB; and
2) on the request from a Provincial Government to the Board, provide technical advice and assistance to that Provincial Government.

Line departments

Each sector within public administration should identify at least one of its existing staff as the point of contact on technical environmental matters. One role of the officer would be to monitor the activities of other sectors to ensure that they do not have an adverse impact, in the long term, on those resources

for which the officer's sector is directly responsible. This role should be clearly written into job descriptions/duty statements.

Environmental Planning & Assessment Unit (EPPU)

Proposed functions

- Provide a secretariat function to EPAB;
- Implement the environmental policies and programmes of the National Government through the Provincial Governments;
- Liaise with Provincial Governments on all environmental matters, and ensure co-ordination of planning and assessment activity across provinces;
- Undertake or assist with the conduct of socio-environmental assessments of significant national projects, or at the behest of Provincial Governments;
- Identify and plan nationally for the protection of unique Solomon Islands botanical and wildlife heritage, for the establishment and management of national parks and conservation reserves, and for the protection of the nation's cultural heritage; and
- Maintain liaison with regional and international environmental organisations.

Structure & staffing

The existing Environment and Conservation Division has a professional/technical staff of four established and one non-established positions, although only three are currently filled. Of these, two officers have professional qualifications. The vacant Senior Environment Officer and the Conservation Officer positions should be filled immediately to deal with the existing work-load.

Further staff will be required under the preferred Option 2, although an attempt has been made to keep these to a realistic minimum. With Option 2, it is envisaged that the EPPU would be established at the Division level (within the proposed Office of Planning and Assessment) with two branches:

1) *Planning & Assessment Branch*: Two sections of (a) Physical Planning and Assessment Section (PPS) and (b) Socio-Environmental Assessment Section (SEAS). This Planning and Assessment Branch would primarily comprise the current Physical Planning Unit, with the addition of two staff: an EIA specialist and a social scientist. For both positions, recruitment of expatriate staff would be required for a minimum of two years pending recruitment of Solomon Islanders. Because of the small number of university students currently pursuing biological science courses or sociological training, it is likely that this period would need to be extended.
2) *Protection Branch*: Two sections initially of (a) Cultural Heritage and (b) Resource Protection. The Cultural Heritage Section would operate the National Museum. In addition to existing staff there is an urgent need for recruitment of a curator for the operation of the laboratory and preservation of artefacts, etc. The Resource Protection Section would need not less than six professional/technical staff: a botanist and herbarium assistant, a wildlife specialist and assistant, a national parks and reserves manager, and an environmental educator.

There is an economic and environmental need for the establishment of separate sections for Botany, Wildlife, and National Parks and Reserves. But funding constraints and the availability of qualified staff necessarily takes the timing of such an objective towards the turn of the century. The continued recruitment of volunteers to work in these fields would seem appropriate.

As a further interim measure it is proposed that ECD approach appropriate overseas universities to establish arrangements for Ph.D students to use Solomon Islands as a site for appropriate botanical and wildlife field studies. While Solomon Islands experience with foreign universities has not always been a happy one, with appropriate safeguards on samples and data such arrangements can be mutually beneficial, for the student in academic recognition, and for Solomon Islands as a cost-effective way of building up knowledge of its natural resource base.

Director of EPPU

The position of Director (Assistant Secretary) of EPPU is seen as more senior than the current ECD Director position. It is a senior-executive-level planning, coordination and liaison position. External funding from a bilateral or multilateral source should be a high priority to fill this position with a qualified and experienced resource planner/manager. A scholarship for relevant training in environmental management at an Australian or New Zealand university should be secured before 1995; one such course is the one-year postgraduate Diploma in Environmental Management from Griffith University in Brisbane, Australia.

Policy Evaluation Unit & Economic Planning Unit

The PEU has a nominal establishment of five persons; there are currently two staff in position, with a third undertaking a postgraduate course in environmental science/management at Griffith University. The remaining two posts are indicated for short-term (one- and two-year) expatriate staff. Approximately five or six staff would transfer from MFEP to OPA. Thus there is nominally a staff pool of 10 or 11 positions across the economic and policy appraisal functions.

An examination of the volume of appraisals conducted in PEU indicated that a technical assistance grant should be sought immediately for the recruitment by the end of 1992 of two environmental economists, one appointed for the period 1993–1994 and the second only for one year in 1994.

The two-year appointee would undertake the economic environmental appraisal of project development proposals within the OPA; the PEU officer currently at Griffith University would work for one year as a counterpart and then take over his role. The one-year appointee would set up a system for the coordination of project appraisals between national and provincial governments and guide the Provincial Planning Boards in developing their capacity for economic and environmental appraisal.

A further Solomon Islands graduate officer should be selected to undertake postgraduate training in environmental science and economics at Griffith University in 1994.

3.4.2 ***The Provincial level***

The Provincial Planning Boards (PPBs) established under the Town and Country Planning Act are considered to be the appropriate administrative mechanisms for policy formulation and environmental assessment at the provincial government level. The EPAB and PPBs can communicate routinely through copying to each other their reports of board meetings. In addition, the EPAB Chairman and the Director of the EPPU should make every endeavour to attend meetings when requested by the PPBs. At the bureaucratic level, the graduates of the special diploma course in Physical Planning conducted by SICHE, who have been posted to a provincial government, are the natural points of contact between EPPU and the province. However, not all provinces are fortunate to have secured the services of planners with such training. There would seem to be a clear need for the conduct of at least one and possibly two further courses for an intake of another 10 to15 trainees for the Diploma of Physical Planning within the next five years; but for this SICHE will require appropriate additional funding.

In the interim, it is recommended that officers are seconded from the National Government to those provincial governments needing assistance, with a provincial officer working at a lower level initially to the secondee as a counterpart, and then, with training, subsequently taking over.

Proposed functions of PPB:

- Provide advice on provincial policy related to conservation of cultural and natural resources, including environmental planning and appraisal, and supervise communally appropriate enforcement of legislation;
- Monitor the environmental aspects of development activity within the provinces and advise on the progress and effectiveness of programmes related to the conservation of natural and cultural resources;
- Co-ordinate environmental planning between Area/village levels on the one hand and the National Government on the other hand;
- Advise Provincial Government (with technical assistance, as required, from the EPAB) on the degree of environmental risk of development proposals;
- Implement the National Planning and Assessment Act (once gazetted) at the provincial level;
- Perform such other tasks as are given to the PPB by the Provincial Government from time to time relating to environmental matters.

3.5 Institute resource pricing in the National Accounts & other economic policy for achieving sustainability

There are many broad economic instruments which countries can apply as flexible and efficient means of promoting sustainable practices. In Solomon Islands there is a need for a review of existing monetary and fiscal policies for their impacts on sustainable resource management and environmental protection. Those taxes, or subsidies, which serve to damage ecosystems or resources should be corrected.

New economic instruments should also be considered as a way of promoting sustainability. For example, where the full cost of a service or resource is not borne by the user, this serves to lessen the interest in conservation. Many countries have found the introduction of the "user pays" or "polluter pays" principle useful in reducing unnecessary depletion of a resource in the first instance, and in the second, providing a strong incentive for pollution control. For example, a timber industry should pay the costs of any marine pollution, soil loss, fertility loss, polluted water run-off, and loss of biological diversity, as well as the direct cost of timber extraction. Royalties paid to landowners should fully reflect all such environmental costs as well as reflect the true market worth of the timber species.

Pricing policies and standards can be used to encourage industry to adopt resource-efficient technology. For instance, high prices for imported fossil fuel and for electricity produced from such imports can promote greater use of solar energy.

If the Solomon Islands Government is to take fully into account the effects of its policies, it will need to adopt environmental and resource accounting procedures.

Improving environmental awareness & education

Effective long-term environmental management will require an informed and supportive public. It was stressed in the National Environmental Management Strategy Seminar that all Solomon Islands people should be targets for environmental awareness programmes, from villagers to politicians. Women must not be neglected because their working day activities always "touch" the environment and they have an important role in the early shaping of the attitudes of their children.

It is the resource owners who decide what activities will occur on their land, and it is therefore they who have the greatest effect on the environment. Consequently the resource owners should be the prime target for awareness-raising programmes. Likewise, if the resource owners are informed about environmental legislation and the reasons for it, they are more likely to comply.

Women have an important role in the environmental education of the growing generation. (photo: SPREP)

Currently, the non-governmental organisations and the churches have the most extensive information networks at the village level, and thus are important channels for conveying environmental messages and increasing public awareness. Many other media forms were suggested in the Seminar working groups for delivery of environmental messages, including regular radio programmes, newspapers, market notice boards, theatre group actions, church sermons and more formal education processes. Some environmental education is included in primary and secondary curricula within broad subjects such as geography. At tertiary level there has been a significant environmental content in Forestry and Agriculture certificate courses, most particularly in the diploma course on Physical Planning, all being conducted by the School of Natural Resources of SICHE. Currently there is no specific environmental course at any of the formal educational levels. All working groups highlighted a need for environmental education to achieve effective environmental management, and a number of specific programmes or activities were also highlighted.

4.1 Review & upgrade the status of environmental education in Solomon Islands

Every endeavour must be made to ensure that environmental education is:

1) made an integral part of formal education at all levels; and
2) directed to the community at large to raise public awareness of environmental issues and sustainable development principles.

For the period 1992–1996 the strategy is broken down into the following goals and programmes:

Strategy goals

Through this strategy it is anticipated that:

1) The environmental content in curricula will be increased at primary, secondary and tertiary education levels.
2) Public awareness of the environment and of environmental issues will be enhanced, with a resultant increase in public support for environmental management initiatives.
3) A better informed public will be more aware of the environmental consequences of their own actions, and more capable of reaching well-informed conclusions on sustainable development issues.

Programmes

***4.1.1** Establishment of an Environmental Education & Information Unit*

see Appendix 1, page 97

To ensure carriage of these goals the creation of an Environmental Education and Information Unit within the Environment and Conservation Division is proposed (Environmental Planning and Protection Unit, see Section 3.4.1). The role of this unit will be to increase public awareness and produce environmental information pertinent to Solomon

Islands for use in environmental awareness programmes. A number of strategies have an environmental education component requiring production of educative materials. Rather than relying on short-term consultancies that are often only a one-off solution to information needs and that do not leave an on-going capability in the country, funding could more effectively be spent in establishing an Environmental Education and Information Unit. This unit would be responsible for the preparation of environmental and resource information materials for use in environmental awareness campaigns for a variety of end users. It would be capable of producing high quality audio-visual materials as well as information leaflets and posters. It would also assist in co-ordination of environmental awareness components of extension programmes in other divisions and ministries.

***4.1.2** *Provincial & district environmental awareness workshops*

see Appendix 1, page 99

Repeated reference is made throughout this document to the National Environmental Management Strategy Seminar held in November 1991. This Seminar was specifically directed to the development of strategies, through the presentation of reports for discussion, and the conduct of a series of consultative workshop sessions. These sessions ranged across a wide spectrum of environmental concerns associated with the need to ensure that development proceeds sensibly in a manner least disruptive to the natural, built, or cultural environment.

There is need for early follow-up to that Seminar so the momentum generated there is not lost. But rather than continue broadly scoped discussions, the consultative process could now focus more productively on specific major development thrusts, or environmental issues with an objective of arriving at detailed recommendations for action. District and provincial workshops would provide opportunities for further sharing of experiences on those specific issues which have emerged from the NEMS as ones of national concern. Provincial and district workshops have been requested by a number of provinces to promote environmental awareness in the provinces and to develop environmental policy, planning and strategies at a grass-roots level. This programme would facilitate environmental awareness workshops over a two-year period.

This could then culminate in a further National Environmental Management Workshop to focus on specific major development thrusts, and review the progress of the NEMS. The planning for such workshops would be an appropriate function of the National Task Force on

Environment and Sustainable Development. Forward planning should commence early on what could become the first in a regular series of national consultative workshops.

***4.1.3** Curriculum development in environmental education for primary & secondary schools*

see Appendix 1, page 100

This programme would develop lessons and teaching aids for primary and secondary levels, incorporating environmental education into other courses such as English, Maths, Social Studies, Home Economics or Science.

***4.1.4** Curriculum development for religious seminaries*

Religion is central to the way of life of most Solomon Islanders, and ministers of religion are accorded a high degree of respect. They wield considerable power in the community and are a very important channel for shaping opinion on social issues. There is scope for strengthening the curriculum of seminaries on social aspects relating to environmental management and sustainable development. No programme profile is prepared as this is a matter for each religion to consider.

****4.1.5** Development of environmental fact sheets, educational resources & visual aids*

see Appendix 1, page 101

This programme would develop information resources for NGOs and church groups which have the most effective existing information networks, and others with good community networks. While such organisations are generally keen to bring matters of social and environmental concern to people's attention, they sometimes lack correct information or knowledge about environmental issues pertinent to Solomon Islands. The development of factual resource materials for them would significantly support the goal of enhanced public environmental education.

***4.1.6** Environmental awareness training for government extension officers*

Provincial Fisheries and Agriculture Extension units already reach many rural communities. However, the training of these extension officers emphasises economic development with little environmental background. This programme would increase awareness of environmental issues and emphasise sustainable development through the incorporation of a specific component on environmental management into the annual in-service training of each of these agencies. The proposed Environmental Education and Information Unit of the Environment and Conservation Division could provide this input, with possible technical support from SPREP's environmental education officers.

4.2 Preserve traditional knowledge & management systems

Solomon Islands has a unique and rich culture. The traditional lifestyle was centred around sustainable reef exploitation and agroforestry systems and was based on a close harmony with, and total reliance on, the environment. Many traditional practices are valid today. *Tambus* (taboos) are still effective in conserving some species. However, traditional systems for resource management and the ecological knowledge on which these systems were based are beginning to be lost with the growing emphasis on the cash economy and an erosion of traditional authority.

There have been a number of attempts in the past to record the oral histories of Solomon Islands people, mainly through the National Museum and provincial cultural offices but also through anthropological and sociological studies sponsored by external universities and other institutions. Some current projects such as the National Forest Resources Inventory, a WWF programme based in Western Province, and the MHMS medicinal plants programme are documenting some information on traditional uses of plants and animals. However, the vast reservoir of knowledge has barely been touched. This is not a short-term strategy. Of necessity it is continuing and long term. The urgency of the work increases as the risk of knowledge being lost increases with passing generations.

Strategy goals

1) To protect and conserve the unique culture of Solomon Islands.
2) To document traditional knowledge and management systems.
3) To reinforce the use of traditional knowledge and management systems in contemporary resource management.

Programmes

***4.2.1** *Documentation of traditional knowledge & management systems*

see Appendix 1, page 102

This programme would aim to boost current efforts to document of traditional knowledge and management systems to ensure that they are not lost to future generations.

***4.2.2** *Application of traditional knowledge & management systems*

see Appendix 1, page 104

The Improved Traditional Temotu Agriculture system is an example of how traditional knowledge may be incorporated into foreign agricultural management systems. This programme will assess the feasibility of the application of traditional knowledge, technology and management systems to introduced management practices in all provinces of Solomon Islands.

Strengthening the resource database

5.1 Resource surveys

The National Forest Resources Inventory is scheduled to report in 1993. From that survey will emerge the broad definition of a number of environmentally sensitive areas, and possibly also areas of special botanical or ecological interest. However, the Forest Resources Inventory is oriented largely to forests with potential for timber or pulpwood production (i.e. forests below the 400 m elevation line). While the survey will add considerably to botanical knowledge, particularly the distribution of species, and provide other environmental data, it is not intended to be a substitute for a botanical or ecological survey. An ecological survey must be undertaken at a greater level of sampling intensity and more detailed information needs to be collected across all types of ecosystems.

Systematic botanical surveys and in particular, ecological surveys, together with surveys of wildlife and other natural resources, are fundamental to the development of the scientific database necessary to make informed, environmentally relevant decisions. The data from the National Forest Resources Inventory will form part of that database, but only a part. A national botanical survey would detail all plant life and their ecological associations and give considerable emphasis to the traditional uses of plant species.

The distribution and habitat requirements of most fauna species are also poorly understood, making it

Many strange and unknown plants are found in the forest that need to be described in a scientific database if informed, environmentally relevant decisions are to be made. (photo: SPREP)

difficult to assess threat to species from habitat destruction. And with the current rate of habitat change, wildlife surveys are urgently needed if biodiversity is to be preserved.

The knowledge of Solomon Islands biota is patchy, at best. There is only one way to address this deficiency — systematic fauna and flora surveys must be mounted for the entire country. Such surveys are costly, but they are the only way that the fundamental, vital information needed by the country for resource development planning can be obtained.

Tube-nosed bat Nyctimene albbiventer. *Solomon Islands has a high diversity of flying foxes, but little is known of their status and habitat preference. (photo: T. Leary)*

Strategy goals

1) To institute a programme of surveys of the natural resources of Solomon Islands which will add significantly to the knowledge of those resources.

2) To ensure that all data collection and handling are undertaken in a manner compatible with existing computerised resource database systems in use in Solomon Islands.

Programmes

***5.1.1** Ecological survey of terrestrial vertebrate fauna*

see Appendix 1, page 104

This programme would improve the resource database on terrestrial vertebrate fauna through a systematic survey of ecosystems and habitat types. This will enable assessment of the status of species and the identification of threatened species. The improved database will permit better management decisions and effective environmental planning.

***5.1.2** Systematic botanical survey*

see Appendix 1, page 107

This programme would improve the resource database on the flora of Solomon Islands through a systematic botanical survey, island by island, concentrating initially on those islands which have received the least botanical attention to date. As far as possible, the survey of terrestrial vertebrate fauna should be combined with the botanical survey since habitat information is crucial to a wildlife survey. Existing Solomon Islands curation and laboratory facilities for botanical and zoological specimens would need considerable upgrading.

***5.1.3** Dugong survey*

see Appendix 1, page 109

This programme would assess the dugong population in Solomon Islands and the current level of hunting, with identification of necessary conservation measures. This survey would also need to assess the aerial extent and condition of seagrass beds which are important habitat for dugong.

***5.1.4** Reef, estuary & lagoon resources survey*

see Appendix 1, page 110

Wells and Jenkins (1988) reviewed information on coral reefs and lagoons of Solomon Islands and concluded that very little scientific work has been conducted. During the NEMS Seminar, concern was expressed at possible over-harvesting of reef and lagoon systems in some areas and at the lack of adequate information to formulate sustainable harvesting regimes (see Section 10.2). This programme would address this deficiency of information.

Protecting areas of high ecological, wilderness & cultural value

There are currently no operating protected areas or conservation reserves of any kind within Solomon Islands; a number of areas are included in the statutes but none are functioning as protected or conservation areas. The Queen Elizabeth National Park near Honiara has almost entirely lost its value due to gardening activities. Therefore the need for suitable protected area systems is urgent if conservation of special areas of biological or cultural significance to the nation and the world is to be preserved. However, for land to be securely set aside as protected areas, the landowners require a cash return or some other tangible benefit to compensate for the loss of income which might otherwise have come from alternative forms of resource utilisation.

Approaches attempted in Solomon Islands to foster the establishment of protected areas have met with little success. However, these approaches have mostly taken the form of attempted imposition of sanctuaries or national parks over customary land without due regard to land tenure, traditional practices and enforcement. New approaches to conservation — new protected areas systems — are needed which are compatible with traditional ownership rights and custom.

With no operating protected areas or conservation reserves of any kind within Solomon Islands the forests are being lost. (photo: SPREP)

There are many sites of natural beauty that need to be preserved. (photo: SPREP)

Leary (1990a, 1991b) stresses the urgency for the identification of conservation measures appropriate to the land tenure system of Solomon Islands. She also points out that there are currently neither legislative measures nor incentives for conservation area establishment.

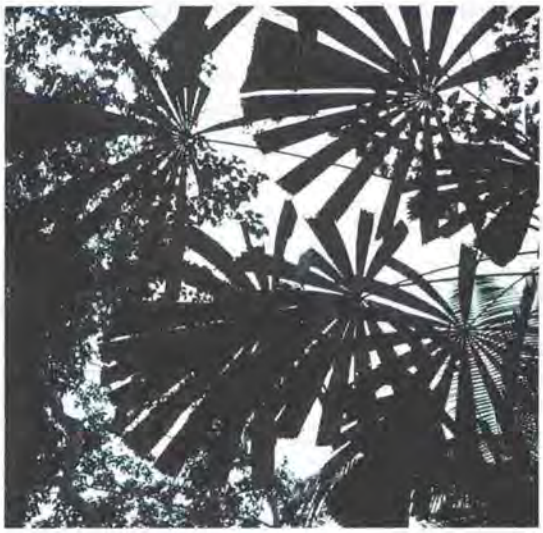
One system that has been advocated for assessment is the Wildlife Management Area (WMA) concept developed in Papua New Guinea. This concept has many attractive features, but its use in PNG has not always achieved the results sought; PNG is currently reviewing the concept.

WMA is a natural area conservation system which aims at the continued, but well-managed, use of materials from all or part of the area set aside (Eaton 1985). A WMA can cover a portion of land owned by one person, by a clan, a village, a census division or a council area; that is, the WMA concept can protect quite small areas as well as large areas of the national park type.

6.1 Develop conservation areas & reserves

Protection of biodiversity has a high priority on international and regional environmental programmes. The diversity of its fauna and flora and high degree of endemism make Solomon Islands a prime action target for biodiversity conservation.

Apart from the constraints imposed by the land tenure system and development process, Solomon Islands is hampered by a lack of information to help it identify areas of ecological and cultural significance. A number of conservation area systems have been proposed in the past (most recently by the Maruia Society), but all have been based on existing information with little detailed survey of proposed areas to assess their merit. The National Forest Resources Inventory may also identify areas of ecological significance, but this is at the macro-level and further detailed survey of the flora and fauna will be needed in order to verify the worth of the selection of such areas for conservation action. In other words there needs to be a cost–benefit analysis for the establishment of conservation areas, but this is only possible with adequate data.



Palm trees are found growing wild in the forests and some of them are found nowhere else in the world. It is therefore essential that this unique biodiversity be protected. (photo: SPREP)

Perhaps the major limitation to the establishment of a conservation area system has been the lack of a role model which is a demonstrable success. This is fundamental if groups of landowners are to be convinced of the economic and other benefits of protecting special areas. Without this landowner awareness, there is little chance of successfully developing a system of protected or conservation areas for Solomon Islands.

Programmes

***6.1.1** Development of a conservation areas system* see Appendix 1, page 111	This programme would aim to develop approaches for the secure protection of areas under customary land tenure that could serve as a model for Melanesia. A range of approaches and legal arrangements would be discussed with Area Councils and landowners of those areas previously identified as potential protected area sites. (Note: Proposed Programme 6.1.4 is a specific case that could serve as input to landowner discussions to assess likely applicability of that model elsewhere in Solomon Islands.)
***6.1.2** Participation in regional & international biodiversity programmes*	Solomon Islands will continue to participate in international and regional biodiversity programmes being co-ordinated by both government and non-government regional and international conservation organisations, particularly in the context of the Global Environment Facility funding to the South Pacific.
****6.1.3** Identification of areas of conservation significance* see Appendix 1, page 112	This programme would undertake detailed verification studies of areas already identified as being of ecological, wilderness and cultural significance. It would include both terrestrial and marine reserves. The identification of further conservation areas would be an integral component. The programme would include a special education project directed to the landowners of the identified areas in order to explain the rationale for the establishment of such reserves, and the benefits of such conservation action. Customary landowners could participate in surveys (this is occurring in the WWF-funded Marovo Resources Project).
****6.1.4** Development of a model conservation area with full landowner participation — Komarindi Conservation Area* see Appendix 1, page 113	A concept plan has already been developed for the Komarindi catchment area under the auspices of SPREP (1991a). Development options with preliminary costings for conservation area development were prepared for two contingencies: 1) The proposed hydro-electric scheme does not proceed and no access road is constructed; and 2) The hydro-electric scheme proceeds and watershed management for the scheme is integrated in a conservation reserve model. This would provide an ideal opportunity for development of a model conservation area for Solomon Islands and Melanesia as a whole. The programme outlined takes the proposal from concept to implementation and would involve full landowner participation.

6.2 Promote eco-tourism

The Ministry of Tourism and Aviation and the Tourism Council of the South Pacific have recently completed the "Solomon Islands Tourism Development Plan 1991–2000". It depends heavily on promotion of nature-based tourism or "eco-tourism". The NEMS Seminar endorsed this approach.

Because of the limited development resources available in the short to medium term, the Tourism Development Plan concentrates on a few centres within Priority Development Areas. The strategy takes a two-tiered approach with the designation of Tourism Development Areas within which are identified specific Tourism Development Centres.

Priority I Tourism Development Areas identified were:

1) Guadalcanal–Florida Islands; and

2) New Georgia Islands (this group includes New Georgia, Vangunu, Rendova, Tetepare, Vona Vona, Kohinggo, Kolombangara, Gizo, Ranongga, Vella Lavella and Simbo).

Priority II Tourism Development Areas are Malaita and south-eastern Isabel.

Within the two Priority I Development Areas, seven Tourism Development Centres are designated. Within the Guadalcanal–Florida Development Area these are:

1) Honiara;

2) north-western Guadalcanal from the western boundary of Honiara to Tambea village;

3) Marau Sound on the eastern tip of Guadalcanal; and

4) Florida Islands.

In the New Georgia Islands Tourism Development Area the designated Tourism Development Centres are:

5) Gizo Island Group;

6) Munda airfield and vicinity and a portion of Roviana Lagoon; and

7) Central Marovo Lagoon.

Three areas within the Guadalcanal–Florida Islands Priority I Tourism Development Area have been identified as nature tourism development sites. These are Lauvi Lagoon, Vihona Falls and Savo Island. In addition, a number of protected areas are proposed for promotion, their main emphasis being nature conservation but with a view to tourism as a secondary use. These areas include: the proposed Rennell World Heritage

***6.2.1** *Nature sites development*

see Appendix 1, page 114

Three areas — Lauvi Lagoon, Savo Island and Vihona Falls — have been identified for nature site development. The Ministry of Tourism and Aviation has now undertaken feasibility studies for Lauvi and Savo and construction of infrastructure was expected to commence in 1992.

***6.2.2** *Proposed World Heritage Sites: Lake Te Nggano, & Marovo Lagoon*

see Appendix 1, page 115

This programme would undertake community awareness programmes about World Heritage status and undertake resource surveys for listing of these proposed two sites, with a view to nature tourism development.

Site (Lake Te Nggano), the proposed Marovo Lagoon World Heritage Site, Arnarvon Island Turtle Sanctuary,Guadalcanal Highlands (including the higher areas of Mt Popamaneseua and Mt Makarakomburu), and Mataniko and Tenaru Falls Scenic Reserves. The NEMS Seminar endorsed nature or eco-tourism development as a means of promoting nature conservation.

Ducorps cockatoo Cacatua ducorps *is currently being exported for the parrot pet trade. (photo: T. Leary)*

6.3 Protect & manage wildlife

Authorised trade in wildlife commenced in 1985. A wildlife trade review was completed in 1990 (Leary 1990a) and the recommendations arising from that review were endorsed by Cabinet in 1991. Concern was expressed in the NEMS Seminar that there has been no implementation of the findings. Regulation and monitoring of trade is required if national extinction of species and local extinction or serious depletion of populations are to be avoided. With a lack of regulations and monitoring of trade, Solomon Islands also risks the imposition of sanctions by international agencies which will close outlets. There is an urgent need for implementation of new management procedures and monitoring of wildlife trade. As trade is already occurring, this should receive high priority.

The trade has recently diversified to include three species of parrot, one of which is protected under the Wild Bird Protection Act, but permission may be given under the Act by the Minister. World wide, parrot populations have been threatened with extinction from trade, and monitoring is especially important for this group. It is also important that baseline surveys of parrot populations be undertaken so that realistic quotas may be set.

A number of species also have potential to be bred commercially in captivity. The NEMS Seminar endorsed

Strategy goals

The development of environmentally acceptable and commercially viable wildlife production industries through the following aims:

1) To have wildlife trade placed on a sustainable basis, well managed and not unduly threatening wild populations of animals.

2) To ensure that rural dwellers will continue to reap financial benefits from wildlife trade.

3) To ensure that the market outlets are not closed by pressure from international agencies because of poor management and over-exploitation of resources.

Programmes

***6.3.1** Regulation & monitoring of wildlife trade* see Appendix 1, page 117	Through this programme, legislation will be drafted to manage wildlife trade, better record-keeping procedures will be implemented and monitoring procedures established. This will permit application of quotas and thereby better ensure sustainable management of wildlife trade.
***6.3.2** Insect farming & establishment of Insect Trading Agency* see Appendix 1, page 118	A feasibility study on insect farming and the establishment of a trading agency for the marketing of insects to ensure equitable returns to farmers shall be undertaken.
***6.3.3** Feasibility study of farming other species of wildlife* see Appendix 1, page 120	This study would examine the feasibility of establishing farming/ranching operations of other species of wildlife, such as parrots and reptiles, which are currently being harvested from the wild and exported.
***6.3.4** Population survey of parrot species currently subject to trade* see Appendix 1, page 121	This survey will assess the population status of the three species currently being traded — the white cockatoo, the cardinal lorikeet and the Eclectus parrot. It will allow for realistic quotas to be set and will develop management guidelines for the trade.

the concept of sustainable commercial production of wildlife. Butterfly farming is one such venture which has been successful in other countries. Other species for which feasibility studies should be undertaken include parrots and reptiles.

6.4 Protect biological diversity

The diversity and particularly the level of endemicity of animal species in Solomon Islands are quite outstanding. There is also a high degree of diversity of plant species, although to nowhere near the same extent as for animals. This was highlighted in the State of the Environment Report and briefly discussed in Sections 2.3.4 and 2.3.5. Melanesia is now recognised as one of the world's major centres of biological diversity, although the value of the area in relation to the biological diversity of the world has yet to be determined.

There is a need for further systematic studies of Solomon Islands biodiversity; before investing in such studies, it must first be demonstrated that the benefits of conserving of species and ecosystems outweigh the costs of their development, both on a national and global level.

The SOE also highlighted the importance of establishing a conservation area system before representative habitats are lost. Due to the land tenure system in

Solomon Islands such conservation areas must be developed on customary land. Currently there is little incentive in Solomon Islands for this to happen and there is a strong need to identify conservation measures appropriate to the customary land ownership of Solomon Islands. Threats to biological diversity are increasing rapidly as a result of loss of ecosystems and habitat through deforestation and the growing wildlife trade.

There is currently a proposal for a conservation area on customary land in the Komarindi catchment area near Honiara; this was considered in the context of a proposed hydro-electricity scheme for the area (SPREP 1991a). This proposed development of a conservation area on customary land could conceivably serve as a model for conservation area development elsewhere in Solomon Islands.

Programme

*** 6.4.1** *Costs & benefits of conservation of biological diversity in Solomon Islands*

see Appendix 1, page 122

This study would examine the costs and benefits of biological diversity conservation on three levels:

1) the level and value of biological diversity in Solomon Islands;
2) the costs and benefits of a national programme of biological diversity conservation in the country; and
3) the specific costs and benefits of establishing conservation areas on customary land.

Improving waste management & controlling pollution

The Solomon Islands environment is becoming increasingly polluted, particularly in the vicinity of the main centres of population, but also as a result of timber extraction and milling, and fish processing. The level of pollution is not as pronounced as in a number of other Pacific Island countries. This presents Solomon Islands with an opportunity to act now before the problems become worse.

The underlying problem for the urban centres is the inability of services to keep pace with population growth — both through the high birth rate and as a result of migration from rural areas. If this growth rate is maintained, urban pollution will increase rapidly and, without corrective action, human and environmental health will deteriorate.

Strategy goals

1) To improve the management of waste.
2) To reduce solid waste generation and to improve the collection and disposal of solid and hazardous waste.
3) To control the level of pollution from industrial processing and other activities.
4) To reduce the use of toxic chemicals and handling of biocides and other toxic chemicals.

7.1 Improve disposal of solid wastes & sewage

Solid waste

In the urban centres, the inadequate disposal of solid wastes and the lack of suitable landfill sites for garbage dumps are the major pollution issues. In most urban areas the disposal of household waste is poor and litter and other garbage are commonly seen. The problem is more acute in Honiara, but none of the provincial centres has adequate garbage disposal.

Programmes

***7.1.1** *Improved solid waste disposal programme*

see Appendix 1, page 123

This programme would seek to improve systems for:

1) the collection and disposal of solid wastes; and

2) the management of landfills and garbage pits.

***7.1.2** *Waste disposal education*

see Appendix 1, page 124

A programme would be launched blending public education and inducement to help reshape public attitudes concerning the disposal of waste.

In Honiara, the existing Ranandi dump is poorly managed, resulting in foul conditions, obnoxious smells and swarms of flies. The household refuse is dumped in the open with an occasional covering of soil. Solid waste is contributing to eutrophication of coastal waters, the contamination of groundwater, and the spread of vector-borne diseases.

Sanitation

Sewage disposal is also causing concern in the urban centres where high water tables preclude the use of septic systems. Due to lack of adequate sewage disposal, marine pollution is an increasing issue in almost all provincial centres. High coliform contamination in surface and groundwater near urban centres is likely to be common. Upgrading of sewage facilities is urgently needed, especially in Gizo, Honiara and Auki.

7.2 Reduce pollution from industrial processing

The industrial base of Solomon Islands is small and pollution problems are confined to point sources. These have been identified as the Ranandi Industrial Estate in Honiara, the fish cannery and associated port and shipping facilities at Noro and Tulagi, and oil palm processing on Guadalcanal.

It is essential that future industrial development be governed by appropriate environmental standards to control pollution emissions and that these standards be rigorously enforced. For industries which generate liquid or solid wastes, particularly those which could seriously pollute lagoons, rivers and groundwater, the conduct of environmental impact assessment should be mandatory.

***7.2.1** *Strengthen monitoring of industrial wastes*

see Appendix 1, page 125

This programme would lay the base for strengthening the capability of the Environment and Conservation Division and the Environmental Health Division to routinely monitor the environment for industrial pollution. Capability strengthening will require planning of a practical monitoring programme, engagement of additional technical staff, training, and improved facilities, including field and, particularly, laboratory analytical facilities.

***7.2.2** *Pollution monitoring design for the Noro fish processing facilities*

see Appendix 1, page 126

Owing to the concern for pollution of Vona Vona Lagoon in New Georgia, on which the large Solomon Taiyo Ltd fish cannery and fish meal plant are located (at Noro), a pollution monitoring programme needs to be

designed, in consultation with the company and landowners, for urgent implementation. Plans for the fish processing plants must first be obtained in order to study the effluent treatment and disposal system. Regarding the fishing fleet, a major refit of all boats is conducted once a year. The pollution monitoring programme should extend to visual aspects as well as effluent or noxious discharges.

7.3 Use & abuse of biocides & other hazardous chemicals

Biocides include the wide range of insecticides, herbicides, agaricides, nematicides, and other highly toxic poisons. The use of chemicals, such as DDT for malaria spraying, has been widespread in Solomon Islands in the past, with little assessment of environmental impact. DDT is still used in many rural areas for malaria control and it is likely that there are residual levels of DDT in the environment as a result. Malathion is usually used in Honiara. While it does not have the same cumulative effects as DDT, it is also a toxic chemical. The choice, therefore, lies between increasing malaria-related health problems and possible side-effects from malathion and DDT.

The use of biocides and chemical fertilisers has been widespread on Guadalcanal and in the Russell Islands, mainly with the large-scale commercial plantation activity of coconut and oil palm. Timber treatment and processing chemicals have caused concern in isolated incidents, as outlined in the 1990 Ombudsman's report. Seepage of hazardous materials and leachates may be resulting in marine pollution and contamination of groundwaters. There is little education regarding the safe use and handling of dangerous chemicals. Concern has been expressed over this issue in the 1990 Ombudsman's report and it should now be addressed.

***7.3.1** *Educational programme on the proper use & control of chemicals*

see Appendix 1, page 127

This programme would aim to inform the general public, but particularly those persons who use biocides on a regular basis, of the potential hazards of chemical use and of the correct procedures for safe handling of chemicals.

7.3.2 *Disposal of stocks of unwanted biocides*

At the NEMS Seminar, reports were made of considerable stocks of unwanted biocides stored in drums or other receptacles. For example, the Forestry Division formerly used an arsenic salt to poison unwanted tree species. This practice ceased some years ago, but drums of the poison are still held in store in the Western Province because there is no safe means of local disposal. There are many other instances of stored hazardous chemicals, with the prospect that they could be around for many years unless they can be safely incinerated or otherwise disposed

of without any threat of injury to people or the environment. While the volumes are small by the standards of other countries, the drums or plastic containers are deteriorating, with the likelihood of leaks occurring.

While there is no simple solution, a recent, new development in Australia does offer promise for the practical and safe disposal of biocides and other hazardous chemicals in the region. However, in the past there has been a natural reluctance on the part of each country in the region for a disposal facility to operate within its borders

7.4 Reduce air pollution in town areas

While air pollution in the large cities of the world commonly arises from industrial activity, in Solomon Islands air pollution arises from the widespread practice of burning off the grassland areas as soon as the long grass will carry a fire after a dry spell. Also following dry periods, dust from unsealed roads in the urban centres is a problem.

Programmes

***7.4.1** *Bushfire control campaign*

see Appendix 1, page 128

If this air pollution problem is to be addressed, appropriate action could include:

1) a public education campaign to discourage the unnecessary lighting of fires, where necessary introducing penalties for non-compliance; and
2) an enhanced capability by the community to attack a fire quickly and suppress it. A programme has been developed initially for Honiara, where this problem is particularly marked.

7.4.2 *Dust control campaign*

With the very high capital costs involved for sealing roadways and footpaths, Honiara and other urban centres have but few choices for reducing dust hazard. One is to use water trucks regularly to settle the dust on the frequently used road. This is quite costly in terms of the purchase and maintenance of the water trucks, and hire of additional staff. Another is to use waste sump oil from serviced vehicles to seal the road surface. If done properly this can prove quite effective, but care must be taken to ensure that oil-stained surface run-off from the road pavement does not pollute the stream channels and is not carried to the sea. No specific programme is proposed.

Land resource management (excluding forestry)

Apart from the small area of alienated land in Solomon Islands, land management must be considered within the context of the customary land tenure system. Under this system, land is "owned" in perpetuity and used by a tribe or clan according to traditional unwritten rules that vary across the country. Government policy recognises that such land is owned usually in a lineage group. Under the direction of chiefs or elders, individuals or family groups are given a right to a piece of land to harvest, cultivate or occupy. Neither the Government nor non-Solomon Islanders are permitted to own interests in customary land but registered land may be leased for periods up to 75 years. Most of the customary land that is registered is leased to foreign investors.

More than 80 per cent of the population live in rural villages and obtain the bulk of their diet from subsistence production systems. These are bush-fallow (slash and burn) systems, supplemented by gathering and hunting. Forests play a vital role in village food production, replacing essential soil nutrients for plant production, and providing habitat for animals.

The staple root crops are mostly non-storable so farming systems traditionally had to be reliable with a conservative over-production target. The excess was then used for gift and exchange or, where a market existed, sold. This production system did not appear to intensify land requirements. Today, in the rural areas, even though there is generally no shortage of land (with the exception of islands such as Tikopia), the increasing pressure to produce cash crops to buy goods and pay for costs associated with schooling has caused an intensification of land use. This intensification results in greatly reduced fallow periods. As agricultural inputs such as fertilisers and biocides are prohibitively costly and environmentally undesirable, this intensification of land use must inevitably lead to a decline in soil fertility and land degradation.

While land degradation as a consequence of intensified gardening is not a widespread issue at this time in Solomon Islands, there are some provincial areas

where it is an issue, especially in Malaita. Complaints about degradation centre mostly on erosion, compaction and the effects of fertility loss that occur during and after logging.

Land pressure will clearly be greatest where there is little room for expansion. Solomon Islands high population growth rate will inevitably lead to a need for expansion and intensification of agricultural food production in the longer term. Currently there still appears to be room for expansion, except perhaps around the main urban centres.

While the secondary forest used in the gardening cycle may have little commercial value, any expansion of agriculture due to increasing population or heightened social expectations will inevitably impinge on the primary forest resource.

8.1 Protect the best soil for food crop production

The customary tenure system permits little external control over agricultural or other land use activity. But it should be a basic tenet of all agricultural trainees and agricultural extension officers that the most fertile land should be reserved for food production. Much of the fertile coastal land of Solomon Islands, as in many other Pacific Island countries, has already been converted to coconut plantations, and more recently oil palm establishment.

The small portion of fertile alienated land in Solomon Islands should be carefully husbanded to help provide for future food needs. If the population growth continues around the 3.5 per cent level per year, then the belief that plenty of arable land remains in Solomon Islands to supply the food needs of a population which is doubling almost every 20 years, will prove illusory.

If it is accepted that the top agricultural priority is given to subsistence food production, then this should be the focus of national agricultural policy rather than cash crop production. Such a policy directive would require some reorientation in the field activities of agricultural extension officers.

The planned rural development of agriculture is not easy under customary land tenure. This does not imply that rural planning does not occur, merely that an extended process of consultation and consensus-reaching must first be undertaken. This process involves particularly the genealogies of landowning groups, land boundaries, and primary and secondary usage rights for parcels of land. The Town and Country Planning Act has little application as its jurisdiction is only over alienated land, most of which lies in the urban centres.

8.2 Promote efficient forms of traditional agroforestry practice

The Agriculture Division has been encouraging a conservation farming practice called Improved Traditional Temotu Agriculture. This is widely used in the Reef Islands and is now being encouraged on other islands. The NEMS Seminar suggested taking the best features from other traditional agricultural practices and promoting them more widely. Detailed information on traditional agricultural techniques should be assembled and published for distribution to stimulate further discussion. This may lead to further refinement of practices.

Not all customary agricultural practices are sound, however, as land use pressure forces a drastic reduction in bush- or grass-fallow periods. Where population pressure is high, human-induced soil erosion is common, especially in areas of steeper slopes and high rainfall. For sustainable, continued use of land, soil and water must be conserved and conditions for root growth and crop production at least maintained, if not improved. This requires good husbandry and often costly inputs.

Low-cost input ways of improving crop yields have been researched for many years in the Pacific, includ-

ing Solomon Islands. Practices of mulching, and maintaining plant cover within mixed cropping agroforestry systems, are well recognised for the conservation of water and soil.

The MAL's Agriculture Division has an Agricultural Extension Service which aims to provide technical advice on land use capability and land use planning for agricultural purposes. Extension activity has been directed more to cash crops than to subsistence food production, or to forms of subsistence production which will satisfy local food demands and provide surplus for cash sale.

Clean and adequate drinking water is vital for all rural and urban families. (photo: T. Leary)

8.3 Protect water supply catchment areas

Increasingly, there are complaints of damage to existing and potential water supplies from disturbance of catchment areas by logging or agricultural activities. Clean and adequate drinking water supply is considered a fundamental right. A need has been expressed for the designation of water catchment areas and their protection from disturbance. This may be addressed at either a local level or at a provincial level. Isabel Province, for example, is currently proposing development of an ordinance to designate water supply catchment areas which are protected from logging and agricultural development.

Programme

***8.2.1** Strengthen agricultural extension capability*

see Appendix 1, page 129

This programme would provide technical assistance to enable a Solomon Islands agriculturalist to further develop the Agriculture Division's agricultural extension activity in areas of specific relevance to subsistence farmers.

Sustainable use of forest resources

Forests are a major contributor to the economy of Solomon Islands, providing on average between 20 and 35 per cent of the country's foreign exchange earnings. In 1990 the forest industry became the largest export revenue earner. An average of over 300,000 cubic metres of log exports and about 25,000 cubic metres of sawn timber have been produced annually for local and export markets over the past 10 years (SIG 1989).

More detailed information on the forest resource is provided in the SOE, Section 2.2 (Leary 1991b).

Less than 9 per cent of land, or about 246,000 ha, is currently considered government owned. The government-owned forested land available to the management of the Forestry Division of the Ministry of Natural Resources is approximately 117,616 ha (SIG 1990). The principal objectives for the Forestry sector are contained in the "Forest Policy Statement" (SIG 1989). This policy outlines six principal objectives and a strategy for achieving them. These objectives include provisions for ensuring that the rate of reforestation matches or exceeds the rate of forest cutting on customary land, and also that felling should be conditional on the development of a suitable strategy for subsequent development of the land. The strategy outlined to achieve these objectives includes development of a

Forests are a major contributor to the economy of Solomon Islands; therefore improvements to forest management, particularly on customary land, are important. (photo: SPREP)

Forestry Sector Plan which should include considerations of environmental conservation.

The bulk of forest land remains under customary tenure (87 per cent of all land), and decisions concerning that land are the direct responsibility of the landowner. The Forestry Division can, however, still exert some influence over forest utilisation activities on customary land. For example, the Standard Logging Agreement sets out principles for the conduct of sound, less-damaging logging operations. These include limitations on slopes which may be logged, guidelines for road and bridge construction and provision for unlogged corridors alongside streams. The Forestry Division can also monitor logging company operations and log shipments.

The Forestry Division has been actively engaged in reforestation of logged government-owned land in various parts of Solomon Islands over the last 30 years. Approximately 1,300 ha are now reforested annually, although up to 3,000 ha were reforested annually in the past.

There are a number of forestry initiatives underway at present which it is anticipated will make a significant improvement to forest management in Solomon Islands, particularly on customary land. These include:

- an Australian-funded Timber Control Unit Project for the formation of timber inspection units, to provide training, advice and support to customary landowners in relation to forest utilisation and other management activities;
- a New Zealand-funded project aimed at strengthening the capabilities of the Forestry Division Extension Section and landowners, to assist reforestation on customary land; and
- the Australian-funded National Forest Resources Inventory Project.

It is important that future programmes complement these existing initiatives and are directed at the priority forest management issues in Solomon Islands.

Forest management was one of the major issues discussed at the NEMS Seminar. Three main forestry issues were identified at the Seminar:

- the disparity between the area of forest harvested and the area reforested;
- customary land tenure; and
- environmental impacts of forestry activities.

Harvesting & reforestation on customary land

The rate of harvesting of forests in Solomon Islands, which is expected to increase markedly, is causing widespread concern. Most logging activity (95 per cent) is carried out on customary land. The reforestation taking place is largely on government land. This disparity is of major environmental and economic concern.

An overview of the forest sector (Groves & Byron 1985) estimated, on the then available forest resource data, that the most optimistic figure for the life of the accessible natural forest is approximately 36 years if logged at current levels, or 15 years if the maximum allowable cut (the permissible yield of all logging licences) is achieved. Lacking recent timber resource data, these estimates are speculative; firmer estimates must await the results of the National Forest Resources Inventory. However, there is no doubt that forest is being lost at a rapid rate and this is a major problem for the SIG which relies heavily on the forest industry for a significant portion of its export revenue.

Customary land tenure

While the Government has less control over activity on customary land, any sustainable development strategy must address the issue of forest management on this non-government land. The development and public acceptance of policies and programmes for forestry on customary land represent key challenges for forestry in Solomon Islands.

Without a successful response to this challenge, sustainable development in the forestry sense is simply

The amount of soil destroyed by logging is increasing. Also associated with logging are water pollution, loss of biodiversity, and a shortage of traditional bush building materials. (photo: SPREP)

not achievable and, in practical terms, the primary lowland rainforest of Solomon Islands is doomed to destruction. Should such a pessimistic view prove real, then forest policies would more sensibly be focused on reforestation in order to provide future construction timber requirements without recourse to costly imports, as well as to maintain an export industry. The Forestry Division maintains that this is already in place. But again, once the small remaining areas of available alienated land are reforested, only customary land will be available for establishing industrial plantations.

Thus, whether Forestry Division is dealing with logging of the primary forest or with reforestation, greatly increased attention must be paid to the development of practical systems for environmentally acceptable forest management on customary land, to the benefit of landowners and the broader community alike.

Environmental impacts

Concern has been expressed about the nature and scale of the impacts of logging. Environmental impacts associated with logging have included soil damage, water pollution, loss of biodiversity, and a shortage of traditional bush building materials. While the Forestry Division's Standard Logging Agreement incorporates provisions for minimising the environmental impact of forestry operations, this does not appear to be meeting this objective adequately, particularly on customary land. The existing Timber Control Unit Project and the establishment of timber inspection units in the provinces are expected to greatly improve the Forestry Division's capacity to monitor operations of logging companies and to enforce the Standard Logging Agreement.

Although some effort is put into the identification and protection of culturally significant areas, there is currently little effort put into the identification and protection of environmentally significant areas. There is an expectation that the National Forest Resources Inventory will assist the identification of some such areas. However, that inventory is necessarily being conducted on land with potential for logging and, although broad ecological information is being collected, it is unrealistic to expect that the identification of significant areas of, for example, wildlife habitat will emerge from such an inventory.

There are currently no successful models in Solomon Islands for the designation and management of special areas of scientific or cultural importance ("protected areas"), and important habitat areas and species may be lost through logging operations.

9.1 Promote sustainable forest management

The need for sustainable forest management in Solomon Islands was highlighted as a major issue by the NEMS Seminar, and regarded as a priority area by the National Task Force on Environment and Sustainable Development, and a number of provinces. Concern was expressed that, on available information, the native forests are currently not managed on a sustainable basis, and that the primary rainforests are rapidly being lost.

The achievement of sustainable forest management in Solomon Islands offers many difficult challenges, some of which go to the very heart of customary land use. It must involve a number of interrelated factors, including:

- establishing effective reforestation programmes on customary land;
- developing effective community awareness programmes relating to forestry;
- developing and enforcing forestry policies and legislation which are firmly based on the sustainable development concept;
- developing and using a sound and readily updatable information base for forest management decisions; and
- upgrading and implementing forest practice guidelines which minimise the environmental impact of forestry operations.

The Forestry Division is currently addressing many of these factors.

The improvement of logging standards should both increase timber utilisation (i.e. reduce wastage) and reduce environmental damage associated with logging operations. (photo: SPREP)

The need for the development of effective community awareness programmes on the forestry process, for effective reforestation, and for an effective legislation is critical.

The Forestry Division currently administers a Forest Resources and Timber Utilisation Act, which has been amended many times and is quite inappropriate today. This legislation has been reviewed and a new Bill drafted for consideration by the Solomon Islands Government. While this draft will provide the Government with a greatly improved legal mechanism, it is noted that environmental considerations contained in the Bill could more strongly reflect the principle of sustainable development. It can only be urged that the

legislation which is finally enacted be based on this principle and that it incorporate adequate and appropriate penalties. Forest legislation should also be consistent with other Solomon Islands legislation such as the Companies Act and the Foreign Investment Act. When approved, the legislation should be widely communicated throughout the country in clear and simple terms.

An adequate information base, covering both forest inventory and forest research, is essential for long-term forest management. The National Forest Resources Inventory aims to establish a computerised Forest Resource Information System (FRIS) to improve the reliability of short- and long-term forest development planning, for both commercial and non-commercial purposes, including conservation.This is an important initiative which should be supported in every way. There is also a need for expansion of forest research to improve knowledge, particularly on: natural rainforest regeneration and growth increment; the efficiency and environmental acceptability of timber utilisation practices; and agroforestry techniques, including the production of multi-purpose species, particularly food trees and betel nut palms.

In order to provide a firm basis for the application of environmentally acceptable forest practices for the industry, it is important that simply written but comprehensive Forest Practice Guidelines be developed. These are proposed to be developed by the National Forest Resources Inventory Project together with the Timber Control Unit Project. For such guidelines to work, they must be based on legally enforceable tenets. They should include provisions for reforestation as well as specific logging standards.

The improvement of logging standards should both increase timber utilisation (i.e. reduce wastage) and reduce environmental damage associated with logging operations. A key issue which relates to both logging standards and the implementation of Forest Practice Guidelines is that of compliance. The Standard Logging Agreement is applied, but is often poorly complied with. In some cases the penalty is insufficient to act as a deterrent to prospective offenders who may well be prepared to "take the risk" knowing that if they are caught it is of little financial consequence. In other cases, there have not been the human resources to enforce compliance. It is believed that the Timber Control Unit Project will greatly improve the Division's and landowners' ability to enforce compliance.

One approach to improve compliance with logging standards is to apply a system of penalties and incentives. Penalties must be severe enough to be taken seriously and reflect the nature and flagrancy of the offence. They must also be enforced. A percentage of a forest harvest levy could be returned to the Forestry Division to help pay enforcement costs. Complementing such enforcement of penalties could be the provision of incentives for good forestry practice, such as tax incentives, publicity for good operations, and extensions of licences. Consideration could also be given to an annual award for the company with the best environmental performance.

Many provinces and landowners have expressed the opinion that there is a need to provide assistance to landowners to enable them to extract and market timber from their own land using small-scale, controlled and sustainable methods. This would provide an alternative to large-scale foreign logging. Such assistance should include servicing of equipment, training, and a means to ensure that logging is conducted in an environmentally acceptable manner. Initiatives of this kind have been taken by non-governmental organisations, such as Soltrust, whose programme is currently under review. There are many inherent difficulties with landowner assistance including marketing and environmental monitoring of activities.

Consideration needs to be given to both government and commercial involvement in undertakings designed to foster sustainable forest management and how they can best be achieved.

The road towards sustainable forest management will be a challenging one for the Solomon Islands Government.

9.2 Improve community awareness & information

The NEMS Seminar indicated that there is some misunderstanding in the community about various aspects of forestry. Confusion exists at several levels and appears to be widespread.

At the *provincial level,* there is confusion over respective provincial and national responsibilities in implementing the Forestry Act and, specifically, the role of the Forestry Division in relation to provincial administrations.

At the *landowners' level,* there appears to be a lack of information on landowners' rights in relation to forestry operations on land under their control, particularly relating to negotiations with logging companies. The 1990 Ombudsman's report, for example, indicates that a number of traditional leaders complained that their "customary lands" had been "stolen" in the process of timber rights acquisition by a logging com-pany and that they had been inadequately informed of their rights or where they could seek legal assist-ance. The Timber Control Unit Project, currently underway, aims to address some of these issues by pro-viding information to landowners on procedures for dealing with government, procedures for negotiating with logging companies, relevant legislation and the implication of this legislation for landowners, and the Standard Logging Agreement and means of ensuring compliance with such agreements.

At the level of the *general community,* there appears to be disquiet, particularly from non-governmental organisations, in relation to the way in which forest resources are being utilised.

There is a need for development of greater community awareness in relation to forest practices and the value of forests. Target groups for information include landowners, government agencies and non-governmental organisations.

At the landowners' level, this need should be addressed through a clearly focused campaign which would aim to enhance awareness of the value of forests under customary land tenure as well as the rights

Strategy goals

1) To increase the awareness of landowners of the multiple value of forests under their control.
2) To increase the ability of landowners to manage commercial forestry operations on their land in a sustainable manner with minimal damage to the environment.
3) To clearly identify the respective roles and responsibilities of provincial and national governments in the administration of the national forest resource and subsequently to convey this to provincial and non-Forestry Division national government staff.
4) To document traditional knowledge held by both men and women about forest use and incorporate this information, where appropriate, into forestry policies and management practices.

Programmes

***9.2.1** Customary landowner forestry awareness & traditional knowledge programme* see Appendix 1, page 131	This would include: 1) development of a landowner awareness programme on forest management, forest processes and the value of forests; and 2) documentation of traditional knowledge on silviculture and forest use, and incorporation of appropriate aspects of this knowledge into forest policy and practice.
***9.2.2** Provincial & national government forestry awareness programme* see Appendix 1, page 133	This awareness programme would be directed to provincial and non-Forestry Division national government officials to make them more aware of their roles and responsibilities with respect to forestry legislation, regulations and administrative procedures, and the roles and responsibilities of Forestry Division.

of landowners in relation to logging operations. The latter will largely be addressed by the Timber Control Unit Project and further awareness programmes should be developed to reinforce such initiatives. A closely related aspect that could also be addressed is the documentation of traditional knowledge relating to the use of forests and its incorporation, where relevant, into forestry policy and practices.

At the government level, the need for information could be addressed through the establishment of appropriate forums for communication and exchange of information.

9.3 Increase reforestation

The Forestry Division has had much experience in reforestation on government land over the last 30 years and there is a lot of information available, including research on silviculture of species, establishment and provenance trials. The Forestry Division has planted approximately 26,000 ha to date.

However, the restricted amount of reforestation on customary land is a limiting factor to the achievement of sustainable forest management in Solomon Islands. The Customary Land Reforestation Project (CLRP), funded by New Zealand, is a major initiative that has focused attention on practical approaches to this problem. However, the scope and magnitude of the issue is such that the CLRP alone cannot address the overall needs for reforestation on customary land in Solomon Islands. There is scope for the development of a number of reforestation programmes to complement existing initiatives or to expand the existing programmes. The focus of these programmes would be on customary land.

Any external assistance with reforestation projects must consider recurrent costs. Reforestation is labour intensive and a high requirement for recurrent funding will exist for a long period of time. The shortest rotation is 15 years for *Gmelina arborea*. This time period extends beyond the time frame of traditional externally financed projects; the responsibility for recurrent funding thus falls on the government, which is

often ill equipped to fund recurrent expenditure. This is an aspect which must be considered in aid funding of long-term projects, such as reforestation. To address this, private sector involvement in the establishment of plantations and reforestation projects should be encouraged, wherever possible and appropriate. Long-term commitments should also be sought from donors at an early stage of programme development.

In relation to reforestation projects, there is often a need to look beyond the simple objective of reforestation. Agroforestry and the broader social implications of reforestation also need to be considered at an early stage of programme development.

There are a number of financial issues that should also be examined in the context of reforestation in Solomon Islands. One issue highlighted by the NEMS Seminar is the reforestation levy imposed on logging companies. Logging companies are required to pay a reforestation levy of 7.5 per cent of the value of FOB. This is collected at the same time as export duty which is calculated on a sliding scale to 17.5 per cent of FOB. Bennett et al. (1991) calculated that the reforestation levy in 1990 totalled about $SI 4.4 million, which alone could cover the Forestry Division's recurrent budget of $SI 400,000, plus a development reforestation budget of $SI 4 million. However, despite the stated purpose of the levy, the money has not been applied to reforestation but absorbed into Central Revenue for general disbursement.

The application of this levy to reforestation would greatly boost the reforestation programme in Solomon Islands. However, this is a policy matter for government with appropriate action resting with the National Government.

Strategy goals

1) To increase the level of reforestation on customary land in particular, and also on government-owned land.
2) To increase the level of awareness of landowners of the need for reforestation on their land.
3) To increase the amount of funding returned to reforestation from the reforestation levy and other sources.

Programme

***9.3.1** *Expanded customary land reforestation programme*

This programme would greatly expand the reforestation activity on land held under customary land tenure.

see Appendix 1, page 134

Sustainable use of marine resources

The reliance of Solomon Islanders on marine resources is reflected by one of the highest per capita seafood consumption rates in the world. Fish and fish products have for some time been one of the largest export earners for Solomon Islands, contributing approximately 30 to 40 per cent of export earnings. There would appear to be considerable scope for increasing those earnings further by expanding the current level of commercial catch of tuna and of deep-water snapper offshore, without jeopardising the sustainability of the rate of harvest. The government's concern is to ensure that Solomon Islands and Solomon Islanders receive the maximum economic return from their offshore assets.

Inshore, however, there is deep concern at probable over-harvesting of marine resources, both through commercial fishing activity and subsistence harvest near the centres of high population. This concern was strongly expressed at the NEMS Seminar. Degradation of important fisheries habitats such as reefs and mangroves was identified as a key environmental issue. Other marine-related issues are covered in Chapter 11 (Coastal environment management) and Chapter 7 (Improving waste management and controlling pollution).

Strategy goals

1) To ensure an equitable and sustainable economic return to the nation from commercial fishing.
2) To provide a sustained yield of a variety of marine foods for the people of Solomon Islands.
3) To ensure that damage to fisheries habitats is minimised.
4) To develop commercially valuable export products from marine creatures on a sustainable basis.

10.1 Ensure equitable & sustainable economic return to the nation from commercial fishing

The question of equitable return from commercial fishing can be addressed at both the local and the national level. The fishing agreements concluded between the Solomon Islands Government and other countries are the most obvious way of achieving equitable returns for large-scale commercial fishing. Three major agreements exist at the present time — two bilateral agreements with Japanese and Taiwanese interests, and a multilateral agreement with the United States. The bilateral agreements contain provisions regarding the level of catch, the right to board vessels and inspection. The financial returns from these agreements seem to be rather low.

It is clear that the level of remuneration should be regularly reviewed, including a comparison with prices achieved elsewhere. The size and type of catch need more careful monitoring and the surveillance of fishing activities in the EEZ need to be more systematic. These remarks also apply to the policing of licences given to foreign fishing vessels operating in the EEZ. Particular attention should be given to the level of licence fees.

At the provincial level, the remuneration to local fishermen who sell their catch to fishing companies seems, in general, to be inequitable. Agreements negotiated between villagers and such companies need more careful supervision by provincial fisheries officers.

Overall, as the Legal Review (Boer 1992) indicates, the Fisheries Act and its Regulations need to be thoroughly overhauled to achieve an equitable return to Solomon Islands and its fishermen, and to achieve the goal of sustainable exploitation of the fishery resource. The NEMS therefore endorses the thrust of the Report on the Revision of the Fisheries Legislation in Solomon Islands (Moore 1987), and in particular the role of provincial governments in the implementation of the proposed new legislation.

10.2 Reduce over-harvesting of reefs & lagoons

Management of exploitation of reef and lagoon resources is hampered by lack of information on sustainable yields and lack of suitable management regimes and landowner awareness.

Sound management of any fishery is based on knowledge of its size and distribution, variations in annual recruitment levels and interactions among species. When fish are plentiful, the knowledge needs to be only approximate but, as harvest intensifies, more accurate knowledge is needed. This requires detailed study, often longer term in nature if it is to be scientifically sound.

As the Solomon Islands population is largely settled on the coast, coral reefs are of major importance. Reefs in the vicinity of the larger population centres are generally considered to be over-exploited. The evidence may often be anecdotal, but it is clearly evident in some areas that size and numbers of fish have declined. However, if the Fisheries Division is to establish realistic levels of catch to be imposed on reef harvest around Honiara, for example, considerable further study is called for to assess species, numbers and distribution, and particularly to determine levels of recruitment. It would appear that some form of national quota needs to be imposed and enforced to limit the level of exploitation of green snail *(Turbo marmoratus)*, trochus *(Trochus niloticus)*, and of bêche-de-mer species (at least in Ontong Java). However, a better understanding of sustainable levels of harvest and of the biology of the species involved, especially in the multi-species bêche-de-mer fishery, is needed before this quota can be implemented.

The need for study of reef resources has been discussed further elsewhere in this NEMS (Programme 5.1.4) with a survey recommended for reef, estuary and lagoon resources.

Programmes

10.2.1 *Guideline development for controlled harvest of reef & lagoon resources*	This programme will develop, through research, guidelines for sustainable harvesting of marine resources currently being over-harvested: bêche-de-mer; trochus; green snail; goldlip and blacklip pearl oyster; reef fish; mangrove crab; crayfish; and coconut crabs; and educate resource owners on such guidelines. Baitfish areas may also require further study following the work by ACIAR. This programme would be possible for specific areas identified in Programme 5.1.4 Reef, estuary and lagoon resources survey.
10.2.2 *Promote aquaculture & mariculture efforts*	A number of aquaculture and mariculture programmes are currently operating in Solomon Islands. These include one commercial salt-water prawn farm, a number of grow-out trials of the *Euchemena* sp. of seaweed, and culture of giant clams through a collaborative effort between Fisheries Division, ICLARM, and Guadalcanal Province. It also appears that there may be prospects for pearl oyster culture. The NEMS Seminar recommended that aquaculture and mariculture should be more strongly fostered to reduce the pressure on natural stocks and assist overall sustainable utilisation of marine resources.

10.3 Protect endangered marine species

The marine species of greatest conservation concern are the turtles and the salt-water crocodile.

Fisheries and Environment and Conservation officers releasing a green turtle after it has been tagged as part of the Regional Marine Turtle Conservation Programme. (photo: T. Leary)

***10.3.1** *Conservation of marine turtles*

see Appendix 1, page 136

Conservation action requires three simultaneous actions (the first two are matters for decision by Solomon Islands Government; the third will require external assistance):

1) *Ban turtle shell exports:* Japan has announced its intention to cease trading in turtle shell from 1993. The ban should be imposed at least by the start of 1993.

2) *Continued participation by Solomon Islands in the Regional Marine Turtle Conservation Programme being co-ordinated by SPREP:* This programme involves monitoring and survey of nesting beaches and a tagging programme. The Solomon Islands programme should be expanded beyond the current annual monitoring of nesting in the Arnarvon Islands (Isabel Province) and Obeani and Bagora Islands (Shortland Islands) to include monitoring of important nesting beaches in the eastern provinces.

*3) *Establish Arnarvon Islands group as a Conservation Area:* In the 1970s the Arnarvon group of islands was reported as the second most important hawksbill nesting ground in the world. Recent surveys have indicated a significant decline (by approximately 70 per cent) in the number of hawksbill turtles nesting in the group. This decline is attributed to the extensive hunting for turtle shell by people from Waghena. A wildlife sanctuary was gazetted over the Arnarvon Islands in the late 1970s/early 1980s, but without adequate consultation with landowners. The sanctuary was later abandoned due to disputes with landowners. Landowners have recently expressed an interest in the re-establishment of a Conservation Area for the Arnarvon group, providing it is developed in full consultation with, and with full participation by, the landowning groups. Solomon Islands will require external assistance for the re-establishment of the Conservation Area; a programme profile has been prepared.

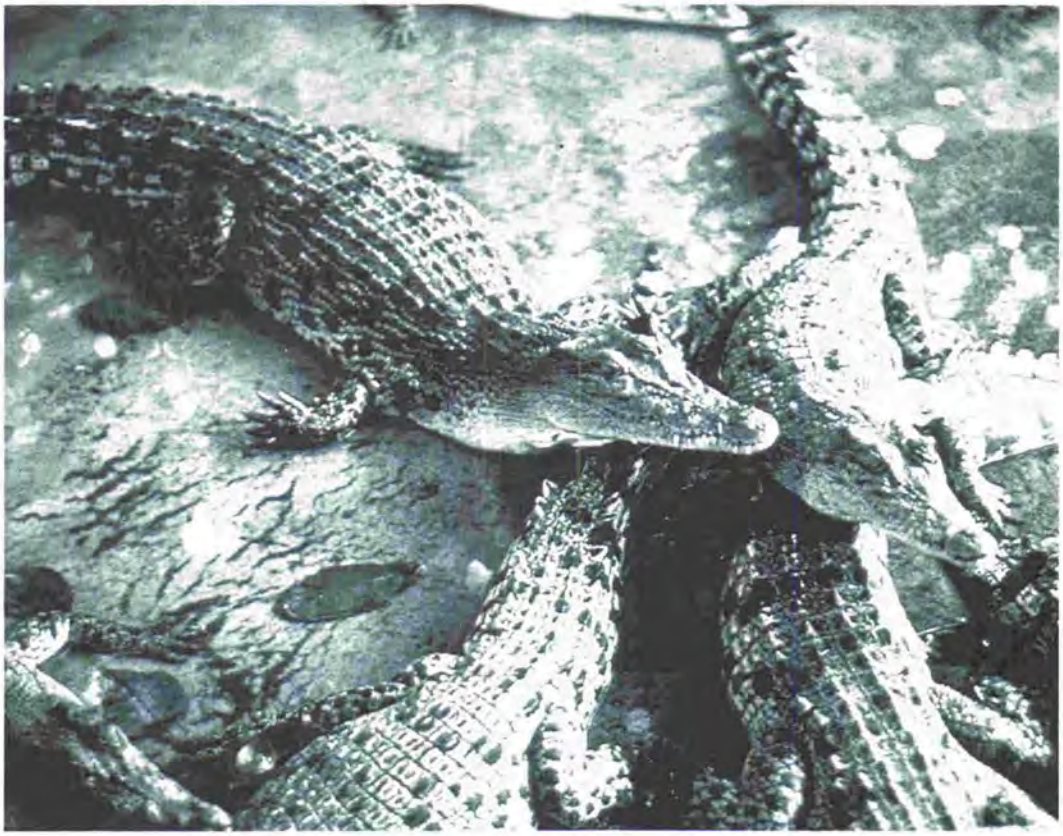
***10.3.2** *Crocodile population monitoring*

see Appendix 1, page 137

Surveys in 1989 indicate that the crocodile population of Solomon Islands has been severely depleted by over-harvesting for the skin trade. A conservation programme is needed if this species is not to be threatened with extinction.

To protect crocodiles from extinction the programme would seek:

1) to educate Solomon Islands communities on the critical status of the crocodile population;



Surveys in 1989 indicate that the salt-water crocodile Crocodylus porosus *population of Solomon Islands has been severely depleted. (photo: T. Leary)*

2) to implement a ban on the export of crocodile skin until a recovery of population numbers is demonstrated, then plan for commercial farming/ranching; and

3) to institute annual monitoring of crocodile populations.

The first two aspects of the programme are in hand; the third programme element requires external funding assistance if it is to be instituted.

10.3.3 *Creation of marine reserves*

Important breeding sites for crocodiles, turtles and sea-birds are already known but these sites have no protection. This should be incorporated into Programmes 6.1.1 and 6.1.3 to investigate means for establishing secure marine reserves for the protection of these species. No additional programme is proposed.

10.4 Protect the reef fishery habitat

A number of measures should be instituted immediately to help protect vital reef resources. For some measures, appropriate administrative actions by government are required. For others, external assistance would be required, for which funding aid would need to be sought.

The thrust of these actions must be to reduce destruction of coral reefs. The following measures were advocated by the NEMS Seminar:

- imposing a ban on live coral exports; or only permitting harvest for export from designated areas;
- educating resource owners on the consequences of destructive fishing methods, such as explosives and reef smashing (reduction of future fish supplies and possible increase in ciguatera poisoning). This could be undertaken by the proposed Environmental Education and Information Unit (see Programme 4.1.1);
- requiring moorings to be constructed for ships which regularly anchor off reefs, to prevent damage by anchors;
- educating communities on the effects of habitat damage through the collection of clams using axes; and
- establishing practical reef management systems.

Damage to corals, such as this staghorn Acropora *can result in excessive algal growth and habitat damage. (photo: SPREP)*

Programmes

***10.4.1** Reef management systems*

see Appendix 1, page 138

This programme would examine management approaches tested in other areas to assess their applicability to Solomon Islands culture and land tenure. This process will lead to identification of practical reef management practices appropriate to Solomon Islands.

Coastal environment management

Most of Solomon Islands population lives in coastal areas as shown in this example from Viru in Western Province. (photo: T. Leary)

Most of Solomon Islands population lives in coastal areas. This zone is affected by both land and sea-based activities. Environmental issues pertinent to the coastal zone were identified during the NEMS Seminar. Some are addressed under separate strategy areas in this NEMS, including pollution control and improved waste management (Chapter 7) and the need for better coastal marine resource database (Chapter 5).

The coastal zone contains many important fisheries habitats of reefs, lagoons, estuaries and mangrove areas. Degradation of reefs and mangroves was identified as a key environmental issue during the NEMS Seminar.

Reef degradation is occurring through:

- sedimentation from onshore soil erosion as a result of forestry and agricultural activities;
- pollution from sewage;
- destructive fishing methods, including using World War II explosives and fish poison;
- over-fishing;
- live coral collection for aquaria and tourist sale.

Degradation of mangrove resources is occurring through:

- clearing for new housing settlements and expansion of old ones;
- cutting for firewood, especially for copra and bêche-de-mer drying;

- siltation from onshore soil erosion as a result of agriculture and forestry activities;
- landfill and coastal "reclamation", particularly for waste dumps.

The planning and implementation of coastal management was identified by the NEMS Seminar as a high priority area for action. The Geology Division, MNR, with assistance from SOPAC, is already carrying out a number of small coastal erosion monitoring programmes. In order to successfully implement coastal environmental management plans, the status of coastal resources first needs detailed assessment. Such detailed survey is a major multi-million dollar task for which funding will not be easy to procure. In the mean time, available funding should be focused on some coastal areas of particular concern.

11.1 Coastal environmental management plans

At the NEMS Seminar, and through consultation with provincial authorities, a number of areas throughout Solomon Islands were identified as having coastal environmental problems. The root causes of the problems vary from area to area, but all identified areas would benefit from the development of coastal environmental management plans.

Two areas were identified as having the most pressing environmental problems:

1) the Noro area encompassing Vona Vona lagoon; and
2) Tulagi and its environs.

These have therefore been given first priority for development of coastal environmental management plans.

Strategy goals	To improve management and utilisation of the coastal zone and coastal resources.
Programmes	
***11.1.1** Coastal environmental management plans for Priority One Areas: Noro & Tulagi* see Appendix 1, page 139	This programme would develop coastal environmental management plans for Noro and Tulagi.
***11.1.2** Coastal environmental management plans for Priority Two Areas* see Appendix 1, page 140	This programme would develop coastal environmental management plans for the areas identified by each province: Nggelas, Savo Is. (Central Province); Choiseul Bay (Choiseul Province); Marau Sound, Lambi, Visale (Guadalcanal Province); Kia (Isabel Province); Kira Kira, Waimaranga, Star Harbour (Makira Province); Langa Langa Lagoon, Lau Lagoon, east Are'Are', east Kwaio and Maramasike Passage (Malaita Province); Duff Islands, Reef Islands, Graciosa Bay, Nupani and Nukapu Islands (Temotu Province); Gizo, Viru Harbour, Ringgi Cove, eastern Vanganu, and Vella Lavella (Western Province).

11.2 Maintain mangrove resources

Solomon Islands has extensive areas of mangroves but information from the early 1970s on distribution and condition of stands is now quite dated. Mangroves are important for their role in providing fisheries feeding and nursery grounds, stabilising shallow-water sediments and shorelines during storms and absorbing excessive run-off during heavy rains.

Strategy goals

1) To ensure the utilisation of mangrove resources is sustainable.
2) To prevent degradation of mangrove areas.
3) To rehabilitate degraded mangrove areas.
4) To increase public awareness of the importance of mangroves.

Programmes

***11.2.1** *Mangrove documentation, protection & rehabilitation assessment*

see Appendix 1, page 141

This programme would supplement the National Forest Resources Inventory by determining the former extent and present area of mangroves/wetlands and their current condition in Solomon Islands. Those significant mangrove stands which require protection would be identified. Projects which encourage the replanting or regeneration of mangroves by local communities would be implemented.

***11.2.2** *Feasibility of sustainable utilisation of mangrove resources for fish-smoking*

see Appendix 1, page 142

This programme would first assess the prospects for sustainable utilisation of mangroves in the Noro – Munda area for fish-smoking. If favourable, practical cutting cycles and management regimes appropriate to village capabilities would then be developed. If the prospects prove unfavourable:

1) formulate restrictions to be imposed on such mangrove utilisation through Area and village councils; and
2) identify suitable alternative fuel sources of suitable flavour and smoking properties for curing fish.

***11.2.3** *Mangrove case study & community education*

see Appendix 1, page 143

This programme would determine the quantity of mangrove-dependent resources in a selected area and their value to the community. This case study would form the basis for the development of educational materials on the environmental function, importance and value of mangroves to local communities in Solomon Islands, for subsequent wide dissemination.

Environmentally safe exploitation of non-living resources

Solomon Islands is a young nation which must exploit every asset it possesses in order to advance its economic base as fast as possible. This includes all living and non-living resources. The principle of sustainable utilisation applies comfortably to living resources which are renewable. The exploitation of non-living resources is not a sustainable activity for the simple reason that such resources, once used, cannot be replaced.

Activities such as mining or oil drilling can potentially cause irreversible damage to living resources. This damage must be minimised through the use of the best modern technology and techniques. Where such damage can be kept at an acceptable level, then Solomon Islands should take every advantage of any commercially prospective resources. But there may be some cases where the likely level of impact is unacceptable, hence possible impacts should be thoroughly assessed before mining commences, and effects should be monitored once mining is under way.

12.1 Ensure minimal damage from mineral exploration & extraction

Solomon Islands has a number of commercially attractive land-based mining prospects. Hard-rock mining interest is mainly directed at gold, with the area of current focus being a marginally profitable prospect at Gold Ridge, near Honiara. A number of earlier environmental concerns about the planned location and design of tailing ponds have already been addressed by the mining company and plans modified. A detailed EIA has been prepared by the proponent.

Apart from the inevitable visual impact, the commonly voiced concerns about mining activity are about the management of waste dumps and tailings and, particularly, about water pollution. Social disruption, land conflicts and other impacts on custom are lessons to be drawn from the history of the Bougainville copper mine. In addition to possible direct effects of mining activity, there is also concern for increased disturb-

Gold Ridge gold deposit seems the most likely mining prospect in Solomon Islands. (photo: T. Leary)

ance of steep watersheds and other fragile environments from the gardening activity which inevitably follows the construction of access roads for mineral prospecting or mining operations.

Because of such concern, the SIG introduced a Mines and Minerals Act (1990) that, among other things, requires applicants for mining leases to provide an environmental assessment together with detailed programmes for tailings and waste disposal, progressive reclamation of land disturbed by mining and for monitoring and minimising the effects of such mining on air, land and water areas. Under the Act, the Minister must be satisfied before granting a mining lease that the environment is adequately protected.

The need for monitoring presents some difficulty as the government does not have the capacity to mount a comprehensive monitoring programme of mining activities. Mining companies should be required to undertake specified monitoring and reporting programmes, but these would need to be supplemented by random checks of company supplied data to ensure compliance with the established pollution control standards.

12.2 Promote alternative forms of energy to imported fossil fuels

The 1991 United Nations war action against Iraq brought home to the Pacific once again its extreme vulnerability to the political whims of larger states which affect the supply and cost of oil. Solomon Islands is heavily dependent on diesel for power generation, and this dependence is increasing with the installation of additional diesel-powered generation capacity in Honiara to reduce the incidence of brownouts. The planned Komarindi Hydropower project, if it proceeds, would feed into the Honiara grid to supplement the diesel generation output for peak load demand.

The predicted major oil price rises following that war did not persist. In this, the Pacific was fortunate. But such unpredictable events can cause oil prices to soar overnight at any time and would place an enormous burden on the nation's already strained economy. The SIG has had acute problems with the funding of recurrent expenditure (operational costs), including the salaries of its employees. Any major increase in imported oil prices would absorb a significant per-

Programmes

*** *12.1.1* *Strengthen monitoring capacity for mining activity***

see Appendix 1, page 144

This programme would upgrade the capacity of the Geology Division of MNR to monitor pollution from mining and related activities and other environmental impacts.

centage of limited foreign exchange reserves for Solomon Islands with an inevitable increase in the accumulated foreign debt.

These economic consequences could force government to cut back on essential infrastructure development and other development activity, and probably also on its services to the community. It would thus seem eminently sensible for Solomon Islands to give a very high priority to alternative energy sources. The emphasis that the government has placed on the Komarindi hydro-electric project is evidence of such a priority. Unfortunately, this development assistance proposal is currently stalled.

But there are many other initiatives that could be pursued with the overall strategy of reducing dependence on imported oil and petroleum products. The nation is blessed with a range of possible alternative sources of power, including hydro-electricity (particularly through mini-hydropower plants), geothermal sources, biomass (steam generation), wind generation and solar power. Some of these have practical prospects, subject to economic and financial feasibility.

Hydro-electricity supply projects would obviously also require close scrutiny for environmental impacts, but there are many reasons why, with proper planning, hydropower development should be given even greater priority.

Perhaps of all prospects, the more economically attractive for small communities that are already equipped with diesel generators, is to reduce the need for diesel fuel by introducing solar power technology developed overseas for supplementing diesel power generation. In Australia, a series of trials have been conducted in remote rural communities in the Northern Territory. A programme profile for the trial of this technology in Solomon Islands is proposed.

It is also evident that there could be far greater use of solar power for water heating, refrigeration and air-conditioning within the major commercial buildings in Honiara.

* **12.2.1** *Pilot trial of solar power electricity supplementation (to diesel electricity generation)*

see Appendix 1, page 145

This programme would test technology developed in Australia for supplementing diesel power generation of electricity in remote communities with solar power generation. This entails the introduction to Solomon Islands of new developments in both solar cell and accumulator technology.

Summary of national & provincial priority action programmes

13.1 National strategy summary of priorities

After deliberation of provincial priorities and the NEMS Seminar, the National Task Force on Environment and Sustainable Development recommended the following areas as priorities for consideration by Cabinet for action in the period 1992–1997. They are listed in order of priority.

1) Improve environmental awareness and education.
   Programmes **4.1.1 4.1.2 4.1.3 4.1.5**

2) Submit all policies, development programmes and projects to EIA.
   Programme **3.2.1**

3) Strengthen the resource information database through survey. In particular:
   Programme **5.1.4**

4) Strengthen the existing environmental institutions and administration.
   Section **3.4**

5) Introduce a comprehensive framework of environmental law.
   Section **3.3**

6) Expand customary land reforestation programme.
   Programme **9.3.1**

7) Improve customary landowner awareness of forestry processes and issues.
   Programme **9.2.1**

8) Provide assistance to landowners to enable them to extract and market timber from their own land using small-scale, controlled and sustainable methods.
   Section **9.1**

9) Preserve traditional knowledge and management systems
   Programmes **4.2.1 4.2.2**

10) Develop coastal environmental management plans for areas with existing environmental problems.
Programmes 11.1.1 11.1.2

13.2 Provincial priority strategies & programmes

Each province identified for the NEMS Seminar a number of initial priority projects and training programmes. Four broad areas were identified. All provinces gave highest priority to community environmental awareness and education, and environmental impact assessment training for physical planners and project planners.

Community environmental awareness and education: Many communities were believed to be unaware of the importance of the environment to their continued well-being. Provinces regarded, as a high priority area, the implementation of a programme of area workshops involving village leaders to promote environmental awareness and to promote good management of natural resources.

Provincial environmental impact assessment training: Following the development of national guidelines for environmental impact assessment, provinces saw as a high priority the conduct of either short courses or workshops directed to village, Area Council and provincial leaders, to educate them on the importance of EIA and improve provincial capability for assessing the environmental suitability of development proposals.

Provincial environmental legislation: A number of provinces are keen to develop their own environmental legislation.

Environmental advisers: Many provinces requested the services of an environmental adviser. But it was also commonly pointed out that provinces had no funding for such positions nor any infrastructure such as housing.

After the preparation of the initial draft of the NEMS, discussions were held with each of the provinces and they were asked to list the top ten priorities for their province, and to identify any areas which were absent from the strategy. The following lists the priorities of each province.

13.2.1 Central

The top ten priority programmes were:

1) **7.2.1** Strengthen monitoring of industrial wastes (which should also include ensuring solid wastes such as wrecked ships are disposed of properly).
2) **7.1.1** Improved solid waste disposal programme. (Should also include other provincial centres such as Yandina.)
3) **11.1.1** Coastal environmental management plans for Priority One Areas: Noro and Tulagi.
4) **9.3.1** Expanded customary land reforestation programme.
5) **7.3.1** Educational programme on the proper use and control of chemicals — this is particularly pertinent in the Russell Islands.
6) **4.1.2** Provincial environmental awareness workshops.
7) **4.1.1** Establishment of an Environmental Education and Information Unit.

8) ***6.3.1*** Regulation and monitoring of wildlife trade.

9) ***3.2*** Submit proposed policies, development programmes and projects to environmental impact assessment. Includes 3.2.1 Standard EIA guideline development for national and provincial governments.

10) ***11.1.2*** Coastal environmental management plans for Priority Two Areas: Nggelas and Savo.

Other programmes seen as high priorities included the following:

a) ***7.1*** Upgrading of sewage disposal in provincial centres such as Tulagi.

b) ***11.2.1*** Mangrove documentation, protection and rehabilitation assessment.

c) ***11.2.3*** Mangrove case study and community education.

d) ***10.2.1*** Guideline development for controlled harvest of reef and lagoon resources.

e) ***10.2.2*** Promote aquaculture and mariculture efforts — such as giant clam and pearl oyster farming.

f) ***4.1.3*** Curriculum development in environmental education for primary and secondary schools.

13.2.2 Choiseul

Choiseul has only recently split from Western Province as a Province in its own right; at the time of the NEMS Seminar the Provincial Government was not in place. However, the appointed administrator attended the Seminar. Discussions with the Provincial Government on the preliminary draft provided the following priorities:

1) ***4.1.2*** Provincial environmental awareness workshops.

2) ***11.1.2*** Coastal environmental management plans for Priority Two Areas: Choiseul Bay.

3) ***5.1.4*** Reef, estuary and lagoon resources survey.

4) ***10.2.1*** Guideline development for controlled harvest of reef and lagoon resources.

5) ***9.2.1*** Customary landowner forestry awareness and traditional knowledge programme.

6) ***6.1.3*** Identification of areas of conservation significance: Choiseul.

7) ***7.1.1*** Improved solid waste disposal programme: Choiseul Bay.

8) Provision of provincial environmental advisers.

9) ***11.2.3*** Mangrove case study and community education.

10) ***9.3.1*** Expanded customary land reforestation programme.

Choiseul Province also recommended an additional programme be included in the strategy — to undertake a feasibility study of hydro-electric power generation at the new provincial headquarters of Choiseul Bay. Since development of Choiseul Bay is still in the planning phase, it is opportune that a feasibility study be undertaken at this time.

13.2.3 **Guadalcanal**

Guadalcanal Province saw 16 strategies as priority areas. The top ten priorities in order of urgency are as follows:

1) ***4.1.2*** Provincial environmental awareness workshops.

2) ***9.2.1*** Customary landowner forestry awareness and traditional knowledge programme.

3) ***9.3.1*** Expanded customary land reforestation programme.

4) ***12.1.1*** Strengthen monitoring capacity for mining activity.

5) ***4.2.1*** Documentation of traditional knowledge and management systems.

6) ***10.2.1*** Guideline development for controlled harvest of reef, estuary and lagoon resources.

7) ***10.4*** Protect the reef fishery habitat (particularly with respect to live coral exports).

8) ***11.2.3*** Mangrove case study and community education.

9) ***6.3.1*** Regulation and monitoring of wildlife trade.

10) ***7.2.1*** Strengthen monitoring of industrial wastes.

Other areas seen to be important, but not included in the top ten priorities, were:

a) ***5.1*** Strengthening the resource database to enable better management and planning of resources. In particular, 5.1.1 Ecological survey of terrestrial vertebrate fauna and 5.1.4 Reef, estuary and lagoon resources survey.

b) ***8.1*** Protect the best soil for food crop production.

c) ***8.2*** Promote efficient forms of traditional agroforestry practice.

d) Promote better awareness of soil conservation and soil erosion problems (see Chapters 8 and 9).

e) ***6.3.2*** Insect farming and establishment of Insect Trading Agency.

f) ***6.3.3*** Feasibility study of farming other species of wildlife.

13.2.4 Honiara Municipal Authority (HMA)

Top priorities for Honiara Municipal Authority were:

1) ***7.1.1*** Improved solid waste disposal programme.

2) ***7.1*** Upgrade sewage facilities in Honiara.

3) ***7.1.2*** Waste disposal education.

4) ***7.2.1*** Strengthen monitoring of industrial wastes.

5) ***7.4.1*** Bushfire control campaign.

6) ***7.3.1*** Educational programme on the proper use and control of chemicals.

13.2.5 Isabel

Isabel Province's top ten priorities were:

1) ***9.1*** Provide assistance to landowners to enable them to extract and market timber from their own land using small-scale, controlled and sustainable methods.

2) ***10.3.1*** Conservation of marine turtles — Arnavon Conservation Area.

3) ***10.2.1*** Guideline development for controlled harvest of reef and lagoon resources.

4) ***6.1.1*** Development of a conservation areas system.

5) ***8.2.1*** Strengthen agricultural extension capability — especially in view of 8.1 Protect the best soil for food crop production.

6) Provision of provincial environmental advisers.

7) ***12.1.1*** Strengthen monitoring capacity for mining activity.

8) ***4.1.2*** Provincial environmental awareness workshops.

9) ***4.1.3*** Curriculum development in environmental education for primary and secondary schools.

10) ***5.1.4*** Reef, estuary and lagoon resources survey.

Other priority programmes in Isabel were:

a) ***7.1.1*** Improved solid waste disposal programme and 7.1.2 Waste disposal education. It was stressed that the latter needs to be a national awareness programme, and not just focusing on Honiara. This was not listed in the top ten as it was thought that other provinces would request this.

b) ***9.2.1*** Customary landowner forestry awareness and traditional knowledge programme.

c) ***11.1.2*** Coastal environmental management plans for Priority Two Areas.

d) ***4.2*** Preserve traditional knowledge and management systems. Isabel has just commenced a programme of its own with a UN volunteer.

13.2.6 **Makira**

Makira Province listed the following priorities:

1) ***9.1*** Promote sustainable forest management (Provide assistance to land-owners to enable them to extract and market timber from their own land using small-scale, controlled and sustainable methods).

2) ***9.2.1*** Customary landowner forestry awareness and traditional knowledge programme.

3) ***9.3.1*** Expanded customary land reforestation programme.

4) ***9.2.2*** Provincial and national government forestry awareness programme.

5) ***3.3*** Introduce a comprehensive framework of national and provincial environmental law, together with the means for its enforcement in a communally acceptable manner.

6) ***4.1.2*** Provincial environmental awareness workshops.

7) ***4.1.1*** Establishment of an Environmental Education and Information Unit.

8) ***7.1.1*** Improved solid waste disposal programme.

9) Provision of provincial environmental advisers.

10) ***10.2.1*** Guideline development for controlled harvest of reef and lagoon resources in conjunction with 5.1.4 Reef, estuary and lagoon resources survey.

13.2.7 **Malaita**

Malaita Province identified the following top ten priorities:

1) ***7.1*** Improve and upgrade sewage disposal in Auki.
2) ***7.1.1*** Improved solid waste disposal programme.
3) ***8.1*** Protect the best soil for food crop production.
4) ***4.1.2*** Provincial environmental awareness workshops.
5) ***7.1.2*** Waste disposal education (to include greater emphasis at the village level).
6) ***9.2.1*** Customary landowner forestry awareness and traditional knowledge programme.
7) ***9.1*** Promote sustainable forest management (to include upgrading and implementing of forest practice guidelines which minimise the environmental impact of forest operations).
8) ***9.3.1*** Expanded customary land reforestation programme.
9) ***5.1*** Improving the resource database: 5.1.4 Reef, estuary and lagoon resources survey.
10) ***6.3.1*** Regulation and monitoring of wildlife trade.

13.2.8 **Temotu**

Temotu Province stressed that it was very difficult to prioritise these projects and that all should be given highest priority. Temotu Province made a list of thirteen priorities, and three were removed from the list as they believed they would also be covered by the other provinces. These three strategies are noted below the list of ten.

The first ten priorities were:

1) ***4.2.1*** Documentation of traditional knowledge and management systems.
2) ***4.2.2*** Application and promotion of traditional knowledge (which is also covered under 8.2 Promote efficient forms of traditional agroforestry practice).
3) ***10.3*** Protect endangered marine species (includes 10.3.1 Conservation of marine turtles and 10.3.2 Crocodile population monitoring).
4) ***3.3*** Introduce a comprehensive framework of national and provincial environmental law, together with the means for its enforcement in a communally acceptable manner.
5) ***3.2.1*** Standard EIA guideline development for national and provincial governments.
6) ***11.1.2*** Coastal environmental management plans for Priority Two Areas.

7) ***6.1.3*** Identification of areas of conservation significance.

8) ***6.3.1*** Regulation and monitoring of wildlife trade.

9) ***4.1.2*** Provincial environmental awareness workshops.

10) ***10.2.1*** Guideline development for the controlled harvest of reef and lagoon resources (especially green snail, bêche-de-mer and trochus).

The following programmes were also identified as priority areas, but it was felt that they would be covered by requests from other provinces:

a) ***7.1.1*** Improved solid waste disposal programme.

b) ***9.2.1*** Customary landowner forestry awareness and traditional knowledge programme.

c) ***9.1*** Provide assistance to customary landowners to enable them to extract and market timber from their own land using small-scale, controlled and sustainable methods.

13.2.9 Western

It is noted that, although Gizo waste and sewage disposal upgrading were perceived to be the most urgent issues, forestry strategies received the highest priority because forestry is the most widespread issue in the province.

Western Province provided the following top ten priorities:

1) ***9.1*** Promote sustainable forest management — particularly assistance to landowners to enable them to extract and market timber from their own land using small-scale, controlled and sustainable methods.

2) ***9.2.1*** Customary landowner forestry awareness and traditional knowledge programme.

3) ***9.3.1*** Expanded customary land reforestation programme.

4) ***9.2.2*** Provincial and national government forestry awareness programme.

5) Provision of provincial environmental advisers.

6) ***5.1.4*** Reef, estuary and lagoon resources survey.

7) ***7.1*** Improved sewage disposal in Gizo township.

8) ***7.1.1*** Improved solid waste disposal in Gizo township.

9) ***4.1.2*** Provincial environmental awareness workshops.

10) ***11.1.1*** Coastal environmental management plans for Priority One Areas: Noro.

part III

Implementation & review

This National Environmental Management Strategy results from the input of working groups at the National Environmental Management Strategy Seminar and consultations by the local environmental adviser to the RETA, Tanya Leary, with provincial and national government agencies, with NGOs, and with other interested individuals and groups. The involvement of the SPREP Team was merely one of facilitating the NEMS Seminar and assisting with the preparation of the NEMS report. But the content is not theirs; on the contrary, this report is a home-grown exercise. It is Solomon Islands own National Environmental Management Strategy. Were it otherwise, its implementation would be seriously in question.

But even as a Solomon Islands initiative, implementation simply will not happen by itself. Much hard work lies ahead for central players if this Strategy is simply not to win the fate of many other planning documents — a dust-gatherer on some forgotten shelf! The implementation of this report must inevitably place an even heavier burden on those involved as it is additional to routine tasks. But without that effort the road to sustainable development of Solomon Islands will be much longer and perhaps not as straight.

Implementation

The first step is seen as the formal establishment of a Task Force to guide implementation.

NEMS Task Force on Implementation

Without the will and commitment needed for its implementation, the NEMS is pointless. Hence, the selection of a core team who will oversee its implementation, marshalling necessary resources, galvanising into action, co-ordinating activities and spreading the net of commitment to the sustainable development principle.

At the request of SPREP, the preparation of the UNCED national report and the SOE was guided by a special Task Force set up for the purpose. This National Task Force on Environment and Sustainable Development comprised about 17 members, including heads or senior officers of relevant national government departments. The Task Force met seven times over a nine-month period.

It is urged that a slimmed-down version of that National Task Force be given the responsibility for implementing the NEMS. A standing membership of eight is proposed for the NEMS Task Force on Implementation, comprising:

- Permanent Secretary, Ministry of Natural Resources;
- Permanent Secretary, Ministry of Provincial Government;
- Permanent Secretary, Ministry of Finance and Economic Planning;
- Permanent Secretary, Ministry of Tourism and Aviation;
- Permanent Secretary, Ministry of Education and Human Resources Development;
- Assistant Secretary, Policy Evaluation Unit, Office of the Prime Minister;
- Principal Physical Planner, Ministry of Agriculture and Lands;

- a representative of the private business sector (perhaps the President of the Chamber of Commerce).

The NEMS Task Force would have an advisory role to Cabinet and would report to the Minister responsible for Environment (currently the Minister for Natural Resources). The Task Force would be responsible for ensuring that funding is sought by the secretariat of the Task Force in time for proposed implementation, and would ensure that review of progress of the Strategy takes place regularly. This NEMS Task Force may also co-opt other members for specialist advice as required. The Task Force would probably not need to meet more than four times a year. The Chairman would be selected from among the members by the Prime Minister. Secretariat support would be provided by ECD/MNR (or other designated unit).

NEMS implications

The NEMS preliminary draft was taken to the provinces, where possible, over the period February–March 1992, for further consultations. Comments from those meetings and other comments received at the national level and from NGOs were incorporated in the document and the revised version submitted via the National Task Force on Environment and Sustainable Development to Cabinet for endorsement by Government. The National Task Force has already prioritised strategies for action for the consideration of governments but further detailed assessment by the NEMS Task Force on Implementation will be necessary in order to convert those strategies and programmes regarded by Cabinet as high priority into actions, and to initiate processes aimed at securing funding for projects. This may involve forwarding programmes with Cabinet's endorsement to SPREP for financial assistance or to the Ministry of Provincial Government and Ministry of Finance and Economic Planning for direct contact with bilateral and multilateral aid donors and other regional organisations through the normal channels. Timing for implementation of priority programmes is indicated in Appendix 3. Efforts should be made to ensure that proposals are submitted to funding agencies in time for scheduled implementation.

Review

A National Environmental Management Strategy is in large measure a snapshot in time, framed in accordance with the economic and other circumstances of the time. It should certainly not be seen as any long-term blueprint for action.

The outcome of this NEMS should be reviewed annually, at the time of preparation of forward estimates and of funding requests to development assistance agencies. The total cost of all proposed programme profiles is, of course, greatly in excess of what could be envisaged for an environmental programme over the next five years, even given its vital importance to sustainable development, and the seeming urgency of many of the proposed actions. Solomon Islands will be fortunate if even a small percentage attracts funding before the turn of the century. However, funding should be vigorously pursued for those programmes to which the National Task Force on Environment and Sustainable Development and Cabinet have given priority.

In addition to the annual review, a major review of the NEMS should be undertaken in five years' time (1997). This might best be achieved by holding a national workshop with provincial representation to determine the priorities for the next five years and/or modify the Strategy according to new needs.

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Detailed programme profiles outlined in the National Environmental Management Strategy

Contents list of programme profiles

Programme profile ***3.2.1***

Standard EIA guideline development for national & provincial governments

Aim and scope

To develop a set of standard EIA guidelines for use at both national and provincial government levels, together with detailed administrative procedures for applying the guidelines.

Description

Guidelines would be prepared in close consultation between national and provincial governments for the application of the EIA process to all government and private sector development proposals, in accordance with the perceived level of potential environmental impact. This process would be applied also to all development aid proposals. Technical assistance would be required for the programme for about three months in order to ensure the necessary level of consultation in this very important guideline development process and for testing of proposed administrative procedures.

Cost estimates

Technical expert — *3 months*	90,000
External travel and apartment accommodation	16,000
Internal travel for consultative purposes	14,000
Publication and dissemination of EIA guidelines and administrative procedures	10,000
Training in EIA	30,000
Total costs *$SI*	**160,000**

While this programme is only at the proposal stage, it could be mounted quite swiftly if funding could be secured. A number of international and regional agencies have already offered their assistance and the estimated cost could be reduced considerably.

Executing agency

The Office of the Prime Minister, in close consultation with the Ministry of Provincial Government and Environment and Conservation Division, MNR.

Potential issues

Because of the limited development of administrative procedures by government at some provincial levels, the development and testing of EIA administrative procedures may be constrained.

Processing/timing

FY 1992–1993.

Programme profile ***4.1.1***

Establishment of an Environmental Education & Information unit

Aim and scope

To establish an Environmental Education and Information Unit within the Environment and Conservation Division for the production and dissemination of resource and environmental information, and to co-ordinate environmental awareness campaigns under other proposed programmes in this strategy.

Description

Environmental education has been highlighted within many of the proposed strategies during the NEMS Seminar. Increased environmental awareness is hampered by lack of educational and informative materials pertinent to Solomon Islands. Reliance on short-term consultancies to provide such information allows little chance for skills transfer to Solomon Islanders, and would require continued reliance on short-term consultancies to address information needs. Instead it is proposed that a specific unit within the Environment and Conservation Division be established to produce resource information for education and public awareness campaigns and to co-ordinate environmental awareness materials for other ministries. The unit would be set up to provide quality audio-visuals, fact sheets, information in poster form, leaflets, newsletters and radio programmes for a variety of end users such as schools, NGOs, churches, tourists, government ministries and landowners. In the first instance a two-year technical adviser with two Solomon Islands counterparts would be recruited. One of the counterparts would receive specialised training in environmental education and production of relevant materials at an overseas institution. The unit could provide information needed as identified under other strategies in the NEMS. The unit would also be responsible for further needs identification and for liaising and co-ordinating with other existing extension programmes.

Cost estimates

Technical assistance — *2 years*	200,000
2 local staff wages — *5-year period*	100,000
Equipment for information production *VCR equipment, cameras, desktop publishing capabilities etc.*	85,000
Scholarships and associated training	30,000
Office equipment and support	15,000
Printing and production of environmental information	100,000
Total costs *$SI*	**530,000**

Executing agency Environment and Conservation Division, MNR.

Potential benefits

a) A long-term capability to meet the environmental information needs of a variety of users.
b) It will be more cost efficient than employment of short-term consultants.
c) This programme will improve the environmental awareness of the community as a whole and will enhance the ability of government extension officers and NGOs to deliver effective environmental information.

Potential issues Under strategy and programme areas 4.1.3, 4.1.5, 7.1.2, 7.3.1, 7.4.1, 9.2.1, 10.4 and 11.2.3, production of educational materials is identified. It is envisaged that this unit would be responsible for the production of such material. The budget of programme-specific information production should be allocated to the information unit. After the first five years, government would need to consider the recurrent funding of this programme.

Processing/timing 1992–1997.

Programme profile ***4.1.2***

Provincial environmental awareness workshops

Aim and scope

To promote environmental awareness in the provinces and to develop environmental planning and action at a "grass-roots" level.

Description

Throughout the NEMS Seminar the need for a "bottom up" approach to environmental planning and management was stressed. A series of regional or District workshops in each province is proposed, culminating in a province-wide workshop where representatives get together from throughout the province. The workshops will address environmental issues at a local level, aiming to improve environmental awareness, formulate the provincial and area strategies, and also, if desirable, policy. It should be noted that Western Province has already undertaken this during the Western Province Environment Week in 1990, but these workshops could review progress to date and revitalise awareness. The participants should be village chiefs, Area Council members, church and other community leaders. The workshops should be run over a two-year period, aiming at covering four provinces per year.

Cost estimates

Technical assistance — 2 Level 5, SI project officers to co-ordinate workshops	
Officers to be attached to ECD	30,000
Area/District workshops	
in each province (8 x $35,000)	280,000
1 provincial workshop	
in each province (8 x $15,000)	120,000
Total cost for 8 provinces *$SI* 430,000	

Executing agency

Environment and Conservation Division, MNR, in consultation with Ministry of Provincial Government and provincial governments.

Potential benefits

This programme will promote environmental awareness and planning at local and provincial levels, and would be expected to stimulate community activity.

Potential issues

Provinces would need to supply office space and some backup support whilst the project officers are in each province. If funding is not available for all provinces simultaneously, the programme may be broken down to provincial projects at an estimated cost of $54,000 per province.

Processing/timing

FY 1993–1994.

Programme profile ***4.1.3***

Curriculum development in environmental education for primary & secondary schools

Aim and scope

To develop environmental education programmes for school teachers.

Description

Teachers play a vital role in shaping community attitudes. It is therefore important that they have the skills to impart correct environmental messages to students. This programme will address this in two ways:

a) through the development and incorporation of an environmental education component in existing in-service teacher training programmes; and
b) by the development of environmental education teaching aids. This material will be tailored to the unique environment and special environmental issues of Solomon Islands.

Cost estimates

Technical assistance for curriculum development

Training of curriculum development staff in environmental training	
2 x 1-month block release, preferably held in Honiara	
2 trainers with fares and accommodation	60,000
Teacher in-service training courses in environmental education	
Primary level $15,000	
Secondary level $15,000	
This includes hire of technical assistance for course planning and delivery	30,000
Printing and production of environmental teaching aids	80,000
Total costs $SI 170,000	

Executing agency

Ministry of Education and Human Resources Development in consultation with the proposed Environmental Education and Information Unit (see 4.1.1).

Potential benefits

This programme will address a key target group — school children — at an early age. If successful, this programme will improve the long-term community attitudes towards the environment of Solomon Islands. There will be an increased ability by teachers to teach environmental subject matter; this will help to increase awareness of environmental issues amongst school children.

Potential issues

Printing and production of environmental teaching aids could be co-ordinated by the proposed Environmental Education and Information Unit after preparation by Curriculum Development. However, if this unit is not established, additional funding may be necessary.

Processing/timing

FY 1993–1994.

Programme profile ***4.1.5***

Development of environmental fact sheets, educational resources & visual aids

Aim and scope

To identify and develop environmental information resources for the community education programmes of NGOs, churches and other groups with extensive community networks.

Description

This programme would identify the environmental information needs of NGOs, churches and other groups in order to permit them to deliver accurate environmental messages, in an understandable way, to rural communities. A number of issues which urgently need public awareness action have been identified under each of the strategies and these should form a starting point for development of information resources; they should be further refined by the provincial workshops (see 4.1.2) and by a national workshop (which would involve representatives from NGOs, churches and rural training centres).

Cost estimates

Workshop for needs identification	30,000
Printing and materials	50,000
Total cost *$S*/ 80,000	

Executing agency

Ministry of Education and Human Resources Development and the proposed Environmental Education and Information Unit (see 4.1.1), in close consultation with NGOs and church groups.

Potential benefits

a) More effective delivery of environmental messages.
b) Increased public awareness of the environment and environmental management issues.
c) Increased support for environmental management initiatives and activities.

Potential issues

If the Environmental Education and Information Unit is not established, additional funding for technical assistance for needs identification and information resource development would be needed.

Processing/timing

FY 1992–1993.

Programme profile ***4.2.1***

Documentation of traditional knowledge & management systems

Aim and scope

To document traditional resource knowledge and management systems.

Description

This programme will:

a) provide a new impetus to documenting traditional resource knowledge; and

b) establish a database of traditional knowledge for possible combination of traditional and imported systems, to create management systems effective in Solomon Islands.

The programme would run initially for two years to engage and train four additional Solomon Islands staff for the National Museum to undertake documentation within the eight provinces.

Cost estimates

Technical assistance — *2 years*	140,000
Materials and support to existing cultural offices *Primarily videotapes and VCR/TV, cameras, cassettes and tape-recorders. This also includes provision for $10,000 for the Guadalcanal, Isabel and Western Province cultural offices to strengthen their capacity to work with the programmes.*	220,000
Travel costs and per diem	40,000
Canoe hire and incidentals	10,000
Total costs *$SI* 410,000	

Executing agency

National Museum of Solomon Islands together with provincial cultural offices.

Potential benefits

This programme will preserve knowledge of traditional management practices and systems.

Potential issues

This programme should be conducted in liaison with MNR and MAL. The collection of some information may be sensitive to local people and as such may have to remain confidential.

Processing/timing

1992 project submission for 1994 start-up.

Programme profile **4.2.2**

Application of traditional knowledge & management systems

Aim and scope

To examine the feasibility of the incorporation of traditional knowledge, technology and management systems into imported management systems.

Description

This study would follow completion of Programme 4.2.1. It could use the successful Improved Traditional Temotu Agriculture system as a model. The study would require the efforts of a four-person team for a period of at least three months. Such a team could comprise: an expert on Solomon Islands customary resource management practices, drawn from the National Museum or one of the cultural offices; two Solomon Islands resource specialists; and one expatriate land resource specialist.

Cost estimates

Technical assistance for feasibility study	
3 months x 4 = 12 person months	90,000
Materials	20,000
Travel, accommodation etc	40,000
Miscellaneous costs	10,000
Total costs *$SI*	**160,000**

Executing agency

National Museum of Solomon Islands, Ministry of Natural Resources, and Ministry of Agriculture and Lands.

Potential benefits

a) Improved management of resources.
b) Increased appreciation by Solomon Islanders of their culture, traditional knowledge and management practices.

Potential issues

If the feasibility study proves successful then consideration will need to be given to developing a programme of implementation. Thus there is expected to be additional funding required for the implementation phase.

Processing/timing

Commences 1996.

Progarmme profile ***5.1.1***

Ecological survey of terrestrial vertebrate fauna

Aim and scope

a) To strengthen the information base on Solomon Islands fauna to enable better management and planning decisions to be taken.
b) To assist the preservation of the faunal diversity of Solomon Islands.

Description

Solomon Islands animal life is of international importance. Excluding Papua New Guinea, Solomon Islands has a greater diversity of animals than any other South Pacific Island nation. The knowledge of Solomon Islands fauna is incomplete, and recent small-scale surveys have revealed a number of species new to science; and doubtless others await discovery. It is also likely that closer examination of existing taxonomy will result in the reclassification of some species into several species. Not only is Solomon Islands fauna diverse, it is also unique. A large proportion of the animals are endemic.

Despite Solomon Islands wealth of animals, very little is known about their distribution, status, ecology and habitat requirements and it is therefore difficult to:

a) assess the potential threat of large-scale habitat changes;
b) identify threatened species; and
c) safely manage wildlife trade.

Already nine species of bird, four species of reptile and four species of mammal may be extinct. If further extinctions are to be avoided a better information base is required.

Much of the current scientific knowledge of fauna has come from museum collecting trips. These tended to concentrate on coastal or easily accessible areas on an *ad hoc* basis, had limited resources, and recorded little or no habitat information. To give the fauna database the necessary scientific rigour, a systematic survey must be undertaken and, because of the rapid loss of forest, such a survey now has some urgency; without it, knowledge of benefit to mankind may be irretrievably lost.

The survey programme would sample all major land systems and habitat types in Solomon Islands. Uniform sampling techniques and sampling intensity would be applied in order to permit comparison between islands and between habitats. This is a major undertaking, requiring a team of wildlife specialists backed by local technical assistance operating for five years. The programme would involve training of Solomon Islanders to carry out future surveys. Survey emphasis would be on mammals and frogs (the two most poorly studied animal groups), although birds and reptiles would not be neglected.

Cost estimates Programme cost is estimated at $3.04 million over a 5-year period.

Phase 1 ***Preparation of detailed design document for the survey***

2-person team of a wildlife survey specialist and a SI assistant — *1 month*	40,000	

Phase 2 ***Survey implementation over a 5-year period***

Staffing		
3 specialists and 3 SI counterpart assistants	300,000	p.a.
Annual rental support for accommodation	75,000	p.a.
Travel		
Internal, includes canoe hire etc.	50,000	p.a.
External	80,000	p.a.
Collecting equipment	50,000	p.a.
Vehicle purchase and running costs	35,000	p.a.
Miscellaneous	10,000	p.a.
Sub-cost per year for Phase 2 $SI	*600,000*	
Total for Phase 2 period $SI	***3,000,000***	
Total costs Phases 1 and 2 *$SI*	**3,040,000**	

Executing agency The local executing agency would be the Environment and Conservation Division, MNR, but the survey would be conducted by an organisation or consortium of organisations of high international zoological repute. Such organisations could possibly include the Australian Museum (mammals), Bishop Museum (reptiles and frogs), the Smithsonian Institute, and National Parks agencies.

Potential benefits This programme will add significantly to the knowledge of distribution and status of vertebrate fauna, and will enable better assessment of threats to fauna population from habitat destruction and wildlife trade. It will also enable better management of wildlife trade and will allow for future planning of conservation reserves.

Potential issues This is a major scientific undertaking, requiring at least two years of planning and preparation prior to commencement in the field. Because of the renowned biological diversity of Solomon Islands, keen interest can be expected from the large scientific institutions to conduct such a survey.

Planning for the survey should start as soon as data from the current National Forest Resources Inventory are available for close analysis. Coverage of most areas should be available by 1993. Planning should be undertaken conjointly with the proposed botanical survey (see 5.1.2).

Processing/timing Phase 1 in FY 1993–1994.
Phase 2 over the FY 1995–1996 – FY 1999–2000 period.

Programme profile ***5.1.2*** **Systematic botanical survey**

Aim and scope

The programme would greatly extend the botanical knowledge of Solomon Islands; the publication of a Flora of Solomon Islands would be a major output. Such increased knowledge will enhance the capability of Solomon Islands to protect plant biodiversity. The aims are:

a) to mount a systematic, island by island, botanical and ecological survey;
b) to develop a botanical database for Solomon Islands which will permit ready access to information and be compatible with existing databases;
c) to foster taxonomic studies of existing specimens and plant specimens collected during the survey;
d) to upgrade storage and curation facilities in Honiara for botanical and zoological specimens; and
e) to prepare and publish a complete Flora of Solomon Islands.

Description

The survey programme would sample all major vegetation types in Solomon Islands. This is a major undertaking, requiring a team of botanists and ecologists backed by local technical assistance. The programme would operate for five years and involve training of Solomon Islands botanists to continue botanical field surveys beyond the programme's life.

Cost estimates

Programme cost is estimated at $2.56 million. Additional funding would be required for the Flora preparation and publication process.

Phase 1	***Preparation of detailed design document for the survey***		
	2-person team of a botanist and an ecologist		
	for 1 month	60,000	
Phase 2	***Survey implementation over a 5-year period***		
	Staffing		
	2 specialists and 2 SI counterpart assistants	225,000	p.a.
	Annual rental support for accommodation	50,000	p.a.
	Travel		
	Internal, includes canoe hire	40,000	p.a.
	External, includes recruitment	50,000	p.a.
	Travel for families, and overseas consultations, averaged over 5 years	*?*	
	Camping and collecting equipment, chemicals	80,000	p.a.
	Vehicle purchase and running costs	30,000	p.a.
	Miscellaneous	10,000	p.a.

		Survey cost per year $SI	*485,000*
		Sub-cost for Phase 2: $485,000 x 5 $SI	*2,425,000*
	Physical upgrade of herbarium at the Botanical Gardens and zoological facilities in Honiara, together with training in specimen curation for counterpart staff		200,000
		Estimated cost for Phase 2 period $SI	***2,625,000***
Phase 3	***Preparation of Flora and publication*** over a further 5-year period, for which the funding needs should be estimated towards the end of Phase 2 and funding sources sought.		
		Total costs Phases 1 and 2 $SI	**2,685,000**

Executing agency Forestry Division, MNR.

Potential benefits This programme will add significantly to the knowledge of the flora of Solomon Islands and will enable better assessment of possible threats to plant species and ecosystems from land resource development activity. It will also enable better future planning of conservation reserves.

Potential issues This is a major scientific undertaking, requiring extensive planning and preparation prior to the commencement of detailed field activity. It would be inefficient to separate planning for the terrestrial vertebrate fauna survey (see 5.1.1) and the botanical survey; they should be co-ordinated. Likewise, Phase 2 implementation should be closely co-ordinated, wherever possible combining field teams. Access to land will require continued negotiation with landowners and may slow the rate of field work, forcing an extension of the Phase 2 period with additional cost.

Processing/timing Phase 1 would commence during FY 1993–1994.

Phase 2 would commence in FY 1995–1996 and run till end FY 1999–2000.

A review should be conducted of the progress of the programme in mid-term (FY 1997–1998).

Phase 3 commencement would depend on the progress made by the end of the century with taxonomic identification and description, but the production of a Flora is unlikely before FY 2005.

Programme profile ***5.1.3***

Dugong survey

Dugong are widespread through Solomon Islands where suitable habitat occurs. Dugong have traditionally been hunted for their meat but the level of current exploitation and the status of the population are unknown. As subsistence harvesting has threatened dugong populations in other countries, an assessment of the status of dugong populations in Solomon Islands is needed so that management guidelines can be developed and implemented as necessary. An integral part of a survey of dugong is an assessment of the extent and condition of seagrass beds which are an important dugong habitat. There is no information at all on these resources. ECD has had a request for a survey of dugong on the SPREP work programme since 1985, but there has been no action.

Aim and scope

a) To survey the dugong population to establish its status and the current extent of exploitation;
b) to recommend appropriate conservation measures; and
c) to assess the extent and condition of seagrass beds.

Description

A preliminary survey should be undertaken to establish the scope of the programme. Areas where seagrass beds are known to occur should be the initial focus of the survey. Because of the widespread nature of dugong the most effective method is aerial survey. Resource-user surveys would be undertaken to establish the level of exploitation. Prior to, and during the survey, a publicity campaign would be mounted to generate interest in the subject and an awareness of the conservation significance of dugong. Traditional knowledge should also be documented.

Cost estimates

Technical assistance — *2 months*	60,000
Plane charter	70,000
Materials, travel and publicity	40,000
Total costs *$SI* 170,000	

Executing agency Fisheries Division and Environment and Conservation Division, MNR.

Potential benefits

a) Up-to-date knowledge of the status of dugong population in Solomon Islands and an information base which will support sound management decision-making.
b) Promotion of conservation of biological diversity.
c) Improved database on seagrass beds.

Potential issues Nil.

Processing/timing FY 1993–1994.

Programme profile ***5.1.4***

Reef, estuary & lagoon resources survey

The condition of Solomon Islands reefs, estuaries and lagoons has not been studied since the 1965 Royal Expedition, which examined only a few flourishing reefs.

Aim and scope

To assess the current condition of reefs, estuaries and lagoons in Solomon Islands, particularly in those areas identified as being "at risk", in order to provide the information needed for the application of appropriate management measures.

Description

The proposed programme would entail undertaking two levels of surveys of reef, estuary, and lagoon resources:

a) at a national level of sampling intensity, to provide a broad overview of the status of these resources; and
b) detailed resource surveys in "at risk" areas identified from the broad survey, together with study of the dynamics of those reefs, lagoons and estuaries. Areas currently considered to be "at risk" include: Marau Sound, Vona Vona Lagoon, Gizo Harbour, Marovo Lagoon, Roviana Lagoon, the reefs west of Kia, Thousand Ships Bay, Langa Langa Lagoon, Are' Are' Lagoon, Lau Lagoon, Maramasike passage, Walande area, Kwai Islands, Kakambona, Lambi and Visale areas, Rob Roy Island and Waghena areas. Inshore baitfishing areas may also be included dependent upon assessment by broad-scale survey.

Cost estimates

Technical assistance — *1 year, including on-costs*	150,000
Broad-scale survey costs *Includes SI staff recruitment and training*	100,000
Detailed studies of reef stocks and dynamics by SI survey teams	200,000
Total costs *$SI* 450,000	

Executing agency

Fisheries Division, MNR.

Potential benefits

a) Improved understanding of the status of Solomon Islands reefs, estuaries and lagoons.
b) Better information base on which to formulate sustainable harvesting regimes of lagoons and reef resources.

Potential issues

This should be co-ordinated with Strategy 10.2 Reduce over-harvesting of reefs and lagoons.

Processing/timing

FY 1993–1994.

Programme profile ***6.1.1***

Development of a conservation areas system

Aim and scope

To develop approaches for the secure protection of conservation areas under customary land tenure.

Description

This study should examine a range of options and legal arrangements for the secure protection of areas that are appropriate to the land tenure systems in Solomon Islands. These should be discussed with Area Councils and landowners of areas previously proposed for protection.

Cost estimates

Technical assistance	
Conservation area specialist — 6 months	
Legal adviser — 1 month	200,000
Travel	40,000
Field equipment and local hire of guides	20,000
Rental support	12,000
Total costs *$SI* 272,000	

Executing agency

Environment and Conservation Division, MNR.

Potential benefits

This could act as a role model for other Melanesian countries with similar land tenure systems.

Potential issues

This programme will depend on extensive landowner involvement. Only those areas where there is a demonstrable interest in the creation of conservation areas should be included in the programme.

Processing/timing

FY 1994.

Programme profile ***6.1.3*** **Identification of areas of conservation significance**

Aim and scope Through field survey, to provide detailed verification of the significance of areas previously identified as being of potential high conservation importance.

Description There have been a number of protected areas proposed in the past, but all based on existing and inadequate information. This project would seek to verify their significance. It would involve detailed survey and an assessment of landowner interest in creating conservation areas. Only those areas where there is strong landowner interest should be surveyed.

Cost estimates

Technical assistance *2 years external source, including rental assistance and other on-costs*	300,000
Support and employment of local staff	160,000
Field survey and camping equipment	50,000
Travel costs *Includes canoe hire, charter flights*	40,000
Total costs *$SI* **550,000**	

Executing agency Environment and Conservation Division, MNR.

Potential benefits
a) Maintenance of Solomon Islands biodiversity for future generations.
b) Identification and prioritisation of areas for protected area development.

Potential issues Clear interest of landowning groups must be demonstrated before survey of areas proceeds.

Processing/timing 1995–1997.

Programme profile ***6.1.4***

Development of a model conservation area with full landowner participation — Komarindi Conservation Area

Aim and scope To develop a model conservation area for Solomon Islands with full landowner participation.

Description A concept plan has been completed for the establishment of the Komarindi catchment area as a conservation area in full consultation with customary landowners. Landowners would participate in management of the area, and nature tourism opportunities would be developed incrementally. The two options prepared provide for both nature tourism opportunities and other means for compensating landowners for the non-development of land. Both options provide an ideal opportunity to develop a model conservation area for Solomon Islands and the Pacific as a whole, which shall convince other landowners of the economic and other benefits of protecting special areas.

Cost estimates Taken from *SPREP PA 17, April 1991 (SPREP 1991a):*

Option 1 The hydro-electric scheme does not proceed and there is no additional road access. The catchment area is developed solely as a conservation area. The cost estimate for this option is *$SI* **261,000**.

Option 2 The hydro-electric scheme proceeds, and the conservation area is integrated with the hydro-electric scheme. The cost estimate for this option is *$SI* **573,000**.

These costs cover establishment only. Additional funding would be required to cover annual operating costs. Compensation payments to landowners would also need to be determined and further funding secured.

Executing agency Environment and Conservation Division, MNR.

Potential benefits

a) The landowners would derive direct financial benefits from tourism-related activities.
b) A representative sample of Solomon Islands flora and fauna will be conserved.
c) The area could be used as a model for Solomon Islands and other Pacific countries, demonstrating the economic and other benefits of protecting areas.

Potential issues There must be extensive consultation and involvement of landowners in all stages of conservation area development. Types of development within the area must be discussed in detail with the landowners, with guaranteed continued traditional usage assured. Landowner support must be firmly established before funding is sought.

Processing/timing 1993 on-going.

Programme profile ***6.2.1***

Nature sites development

In 1987 three sites were identified by the Tourist Council of the South Pacific for development as nature site attractions, namely: Lauvi Lagoon in southern Guadalcanal, Vihona Falls in Guadalcanal Highlands, and Savo Island in Central Province. Funding amounting to ECU 600,000 has already been approved under the EC-financed Regional Tourism Development Programme which is implemented through the Tourism Council of the South Pacific (TCSP). Feasibility studies have been completed for Lauvi Lagoon and Savo Island.

Aim and scope

The programme will broaden the visitor attraction base for Solomon Islands and, in particular, the Guadalcanal–Florida Priority I Tourism Development Area by assisting landowners to develop and operate tourist attractions:

a) as profitable income-earning ventures, while
b) conserving the natural environment.

Description

Eco-tourism development has conservation implications. For example:

a) Lauvi Lagoon is thought to be the most important breeding site for salt-water crocodiles in Solomon Islands.
b) Savo Island has an important megapode field where the bird population is believed to be declining due to human population pressure. Tourism may promote better resource management and may reduce disturbance of the thermal area.
c) Through the Vihona Falls proposal, the whole Guadalcanal Highlands could be developed as a nature reserve, thereby giving protection to upper and middle elevation forests, the watershed and associated habitats and species.

Cost estimates

These are detailed in the EC budget allocation for the programme.

Executing agency

Ministry of Tourism and Aviation together with the Tourism Council of the South Pacific.

Potential benefits

a) Conservation objectives being met while landowners derive economic benefit from conservation of the areas.
b) Expansion of tourism activity base in the Guadalcanal–Florida Tourism Development Area.
c) The prospect of using this programme as a model for other areas of Solomon Islands.

Potential issues

Nature site development should be undertaken with full landowner participation and in consultation with the Environment and Conservation Division.

Processing/timing

This programme commenced in 1991 and is due for completion in 1993.

Programme profile **6.2.2**

Proposed World Heritage Sites: Lake Te Nggano & Marovo Lagoon

On 13 July 1989, Solomon Islands Government made the decision to become a member of the World Heritage Convention (WHC) and also approved, in principle, to apply for the inclusion of Lake Te Nggano on Rennell Island and Marovo Lagoon in the World Heritage Site listings.

Marovo Lagoon is the largest and best developed lagoon of its kind (with double barrier reef system). The diversity of marine and terrestrial life is outstanding. Rennell is the largest uplifted coral atoll in the world, with the largest lake on a Pacific island. It also has a number of endemic species, most notably endemic birds, and an endemic sea snake in Lake Tenggano.

The programme is being implemented by the Ministry of Tourism and Aviation, and funding of *$SI* 149,430 has been approved under the New Zealand bilateral programme. The aim of the World Heritage Sites listing is not only to provide nature conservation benefits, but to contribute to the local and national economy through establishment of income-generating nature tourism projects such as accommodation lodges and Visitor Centres.

Aim and scope

a) To seek World Heritage Site status for Marovo Lagoon and Lake Te Nggano on Rennell Island;
b) to undertake an awareness programme on the implication of World Heritage status with local communities; and
c) to implement appropriate income-generating nature tourism programmes and developments.

Description

The initial phase of the project is a community awareness programme on the implications of World Heritage listing, while the second phase will involve documentation of the resource database for the listing proposal. The third phase would be expansion of tourism developments; this phase has not yet received budgetary allocation.

Cost estimates

Funding of *$SI* **149,430** has already been allocated to this programme to finance the awareness programme.

Executing agency

Ministry of Tourism and Aviation in co-operation with the local communities of Marovo Lagoon and Rennell Island, and in consultation with the Environment and Conservation Division, MNR.

Potential benefits

a) Conservation objectives being met while landowners derive economic benefit from conservation of the area.
b) Expansion of the tourism activity base through development and expansion of accommodation.

c) Other areas within Solomon Islands may use this programme to enhance both nature tourism and conservation.

Potential issues

This programme should be prepared in such a manner that it is integrated with the traditional resource management practices and cultural requirements of the people, rather than being imposed upon them. This requires the active involvement of local people from the outset. To succeed in the long term the programme must be managed as one of sustainable rural development. Natural resources must meet the needs of the present generation of Rennell and Marovo people, while at the same time ensuring that resources are available for future generations.

Processing/timing

This programme commenced in 1990 and is due for completion in 1994. The education and awareness component of this programme should be completed in 1992 but the survey of resource database in the two areas may continue until 1994.

Programme profile ***6.3.1*** **Regulation & monitoring of wildlife trade**

Aim and scope

a) To ensure that wildlife trade is conducted on a sustainable basis;
b) to monitor trade to ensure that species are not threatened; and
c) to ensure that quotas are realistic.

Description

The programme would be implemented in three phases:

Phase 1 The drafting of the legal instrument to regulate trade according to Leary's (1990a) wildlife trade review recommendations.

Phase 2 The entry into force of the legislation and the implementation of the new management procedures.

Phase 3 The implementation of monitoring procedures: six months after record-keeping commences, the data would be analysed and areas of heavy collection for different species identified; baseline survey/counts of populations would be undertaken in those areas, and permanent survey plots would be established and re-surveyed annually.

Solomon Islands will require outside assistance in the short term to set up these survey systems. Re-surveys of the monitoring plots would take only a short time each year once established, and a Solomon Islands Wildlife Officer would be trained to do this.

Cost estimates

Legal consultancy	
1 month for drafting legislation and regulations	40,000
Establishment of baseline monitoring plots	
3 months	110,000
Travel	45,000
Equipment for survey	25,000
Total costs *$SI* 220,000	

Executing agency

Environment and Conservation Division, MNR, with Attorney General's Chambers.

Potential benefits

Sustainable management of wildlife trade with continued financial benefits to village-based collectors.

Potential issues

Annual re-surveys may require additional financial support. As trade has been going on since 1985, it is urgent that new management and monitoring be implemented as a high priority.

Processing/timing

Legal consultancy: 1992.
Implementation of new management procedures: 1992–1993.
Baseline monitoring: 1993 on-going.

Programme profile **6.3.2**

Insect farming & establishment of Insect Trading Agency

A large trade in butterflies and other insects is occurring. All specimens are caught from the wild. In other countries, trade in wild butterflies has threatened the status of some species. In order to conserve wild butterfly populations, it is preferable that export trade come from butterfly farms or ranches. Butterfly ranching is particularly beneficial for wild populations, as the enrichment planting of butterfly (larvae) food plants actually results in a boost in the total population. A proportion of these may be harvested for export. It is also easier to obtain high quality, high value specimens from ranching than from individuals caught in the wild.

Trials at Dodo Creek Research Station (MAL) have proven that it is at least technically feasible to ranch butterflies in Solomon Islands, although the food plants of many species are unknown. Butterfly farming has not been promoted because of the marketing difficulties. The main problems are:

a) the current marketing arrangements are such that villagers receive a very small proportion of the total profits from the export of butterflies and other insects;
b) it is difficult for villagers to access overseas markets directly; and
c) it is unclear how many commercially viable butterfly species (and other insect species) there are in Solomon Islands.

These problems and difficulties were solved in PNG by the establishment of a non-profit making, government-run Insect Farming and Trading Agency (IFTA). The IFTA pays villagers the price it receives from overseas buyers, less about 20 per cent for overheads of the agency. IFTA ensures that villagers receive a fair price and a higher percentage of total profits from insect exports, ensures quality control is high, and provides the villager with direct access to the market. The IFTA also provides extension services to assist villagers set up butterfly farms/ranches and collects biological information on food plants, etc.

Aim and scope

To conduct a feasibility study on the establishment of a financially self-supporting insect marketing agency for Solomon Islands.

Description

The feasibility study would include:

a) an assessment of the number of species in commercial demand internationally which occur in Solomon Islands;
b) an assessment of potential markets, yearly volume of demand and

retail prices of both high quality, high value species for specialist collectors, and high volume, low value common species for the decorative trade;

c) the cost involved in setting up a marketing agency, including both establishment and recurrent costs and an assessment of its economic viability;

d) an appraisal of economic and financial viability for commercial butterfly farming, including an assessment of the costs of establishment and running a marketing agency; and

e) appraisal of environmental impacts of the proposed industry.

Cost estimates

Wildlife Specialist and Economist
1 month
The feasibility study should include a visit to the IFTA in PNG *$SI* **50,000**

Executing agency

Ministry of Commerce, Trade and Primary Industry in consultation with the Ministry of Agriculture and Lands.

Potential benefits

a) Improved financial returns to rural-based people from wildlife trade.

b) Promotion of sustainable wildlife trade.

c) Potential improvement of the conservation status of butterfly and other insect species being farmed.

Potential issues

With the resolution of marketing issues, complementary projects would need to be initiated to:

a) establish the population status of commercially valuable butterfly species;

b) establish the food plants for those species; and

c) mount an extension project to promote butterfly farming.

Processing/timing

1993.

Programme profile ***6.3.3***

Feasibility study of farming other species of wildlife

Aim and scope

To examine the feasibility of farming/ranching reptiles and birds on a commercial basis and hence to promote sustainable and commercially viable wildlife production industries in Solomon Islands with a broad base beyond that of insects (butterflies).

Description

The feasibility study would include a review of technical feasibility and costs involved, assessment of market location and size, business needs, institutional backup, legal implications, economic and financial analysis and an appraisal of environmental impacts.

Cost estimates

Resource Economist
1 month
Experience in wildlife management and preferably wildlife farming *$SI* **40,000**

Executing agency

Ministry of Commerce, Trade and Primary Industry in consultation with the Environment and Conservation Division, the South Pacific Trade Commission (Australia) and the South Pacific Trade Office (New Zealand).

Potential benefits

a) Potential income to rural dwellers from wildlife farming while promoting the conservation of wildlife populations.
b) The programme eliminates the risk of international trade being closed by international agencies.

Potential issues

Should farming of other species of wildlife appear feasible, further funding would be sought to establish pilot farms.

Processing/timing

1993.

Programme profile ***6.3.4***

Population survey of parrot species currently subject to trade

Aim and scope

To survey the population status of parrots subject to trade, in order to enable management guidelines and realistic quotas to be set for the sustainable management of trade.

Description

This programme should involve field survey of populations of the white cockatoo, the cardinal lorikeet and the Eclectus parrot across Solomon Islands. Technical assistance should ensure that government personnel are trained to undertake any future survey.

Cost estimates

Technical assistance — *12 months*	120,000
Support to local office/training	30,000
Travel	30,000
Equipment	20,000
Total costs *$SI* 200,000	

Executing agency

Environment and Conservation Division, MNR.

Potential benefits

a) Guidelines for sustainable management of parrot trade.
b) Improved knowledge on the status of parrot populations.

Potential issues

Due to the susceptibility of parrot populations to over-exploitation from wildlife trade and the current level of exploitation of parrots, this should be given high priority.

Processing/timing

1993.

Programme profile ***6.4.1***

Costs & benefits of conservation of biological diversity in Solomon Islands

Aim and scope

This study would examine the costs and benefits of biological diversity conservation on three levels:

a) the level and value of biological diversity in Solomon Islands;
b) the costs and benefits of a national programme of biological diversity conservation in the country; and
c) the specific costs and benefits of establishing conservation areas on customary land.

Description

The Solomon Islands study would be undertaken as one part of an evaluation of biological diversity in the South Pacific and Melanesia. The study programme in Solomon Islands would entail:

a) development of techniques and methodologies for estimating the costs and benefits of biological diversity conservation in Solomon Islands;
b) identification of priority programmes required for the protection of biological diversity;
c) identification of priority terrestrial and marine areas which could be developed as conservation areas to protect biological diversity in Solomon Islands;
d) assessment of the suitability of Komarindi Catchment as a potential model for conservation area development, and recommendations on the implementation of this conservation area, including:
   - appropriate lease arrangements,
   - updated detailed costings,
   - mechanisms for the on-going management of the area,
   - mechanisms for on-going landowner involvement;
e) extrapolation of the results of the costs and benefits analysis from Komarindi to the other identified priority conservation areas.

Cost estimates

$SI **150,000.** Funding would be provided by the Department of Arts, Sport, the Environment, Tourism and Territories (DASETT), Australia, and channelled through UNEP.

Executing agency

Environment and Conservation Division, MNR, in co-operation with SPREP.

Potential benefits

The development of a model system for the establishment of conservation areas on customary land.

Potential issues

Very tight constraints on ECD staff availability are likely to persist in 1992.

Processing/timing

Project would run for a four-month period from February 1992, in two phases.

Programme profile ***7.1.1*** **Improved solid waste disposal programme**

Aim and scope

To improve systems for:
a) the collection and disposal of solid waste;
b) the management of solid waste; and
c) the management of landfills and garbage pits.

Description

This programme entails technical assistance for advice on appropriate waste collection systems and the provision of equipment for collection and management of solid waste. A waste disposal specialist would be engaged to develop a detailed waste management strategy for Solomon Islands. The brief for this specialist would include:
a) examination of procedures for the separation of organic and inorganic waste;
b) review of options for recycling of waste material and associated potential for private sector involvement in these activities;
c) review of regional and international garbage site planning and design factors;
d) development of country-specific principles for Solomon Islands; and
e) development of a specific waste disposal plan for Honiara and the main provincial centres.

Cost estimates

Technical assistance programme for developing improved waste disposal and management strategies	
Waste Disposal Engineer for 12 months, and SI assistant	150,000
Supply of capital equipment for garbage disposal	
Includes garbage mini-trucks, small dozers with rakes, and other equipment for implementation of recommendations arising from the waste management strategy	1,500,000
Project vehicle purchase and miscellaneous costs	50,000
Total costs $SI 1,700,000	

Executing agency

Environmental Health Division, MHMS, working in conjunction with Honiara Municipal Authority and provincial governments and in consultation with Water Resources Section of the Geology Division.

Potential benefits

The management of waste is an increasing problem in Solomon Islands. This programme and assistance with its implementation through the purchase of essential capital items will greatly assist the relevant authorities involved in waste management.

Potential issues

Nil.

Processing/timing

Development of waste management strategy: FY 1994.
Implementation of strategy: FY 1995 – FY 1996.

Programme profile ***7.1.2***

Waste disposal education

The disposal of waste in Solomon Islands is a serious and growing problem, especially in Honiara. Education campaigns need to be devised which focus firstly on Honiara; but the principles are capable of extension to other provincial centres for the development of appropriate programmes there. The development of a programme in Honiara would, in effect, provide a case study.

Aim and scope

To foster the concept of the anti-social nature of littering and improper disposal of waste through education programmes, anti-littering penalties, and other inducements.

Description

This programme would involve three elements:

a) Design and delivery of campaign, aimed primarily at Honiara and provincial centres for training educators and for educating the general community on waste disposal issues, including littering. The campaign would include: preparation and distribution of information; development of appropriate advertising; and use of all relevant media.
b) Development of communally appropriate and culturally sensitive approaches to enforcement of anti-littering regulations.
c) The strengthening of current recycling programmes, including the imposition of a mandatory deposit of ten cents per aluminium can at the time of purchase, refundable on return of the can.

Cost estimates

Development and production of educational materials	20,000
Adviser for development of culturally more appropriate forms of penalties than Western-style fines — *1 month*	10,000
Total costs *$SI* 30,000	

Executing agency

Honiara Municipal Authority and proposed Environmental Education and Information Unit (see 4.1.1) of Environment and Conservation Division.

Potential benefits

The campaign would help mould people's attitudes on littering and waste disposal. The implementation of this programme would maximise use of community groups.

Potential issues

In relation to the recycling proposal, some shopkeepers will object to the administrative requirements of a refundable aluminium can system. If the proposed Environmental Education and Information Unit within ECD is not established, additional technical assistance of $40,000 will be required for development of an education programme.

Processing/timing

FY 1993 – FY 1995.

Programme profile ***7.2.1***

Strengthen monitoring of industrial wastes

Aim and scope To strengthen the capability for monitoring pollution arising from various forms of industrial activity so that timely, corrective action can be taken before serious environmental damage arises.

Description A design study would be undertaken to develop an appropriate programme for industrial monitoring. The study would include, but not be limited to, planning a practical monitoring programme, engagement of additional technical staff, training, and improved facilities, including field and, particularly, laboratory analytical facilities. A two-person team is proposed of an environmental engineer and an environmental chemist for one month.

Cost estimates Design study estimated at $SI **80,000.**

Executing agency Environment and Conservation Division, MNR.

Potential benefits Development of a fundable programme for consideration by development assistance agencies or international environmental organisations.

Potential issues Need for rational use of laboratory facilities of various government agencies in Honiara. Consultation should also be undertaken with the Water Resources section of Geology Division in development of this programme.

Processing/timing 1992.

Programme profile **7.2.2**

Pollution monitoring design for the Noro fish processing facilities

Aim and scope

To design and institute a detailed programme for monitoring the effluent discharged from the facilities associated with the fishing industry at Noro to ensure that the prescribed international limits of acceptable pollution for the marine environment are not exceeded.

Description

The programme would comprise two phases:

Phase 1 — An environmental engineer would be engaged to prepare a detailed working plan for monitoring pollution at the site, together with an implementation schedule.

Phase 2 — This would involve the application of the monitoring programme, with on-the-job training of field monitoring staff.

Cost estimates

Phase 1	Environmental Engineer	
	1 month, including travel and a SI assistant	45,000
Phase 2	Travel, equipment, and maintenance	
	2-year monitoring project by SI environmental staff	50,000
	Incidental on-the-job training costs	5,000
	Total costs *$SI* 100,000	

Executing agency

Environment and Conservation Division, MNR.

Potential benefits

Reduction of pollution and preservation of the inherent tourism asset of the Vona Vona Lagoon area.

Potential issues

The SIG holds an equity in the Solomon Taiyo Ltd venture; consequently care is needed to ensure that the possibility of dispute between the commercial and environmental arms of government does not arise. Following the first two years of the monitoring programme, the cost of activities should be borne by either the SIG or by Solomon Taiyo Ltd.

Processing/timing

1993.

Phase 2 would be best timed to follow the strengthening of monitoring capability proposed in Programme 7.2.1.

Programme profile ***7.3.1***

Educational programme on the proper use & control of chemicals

There is currently little information available to persons directly involved in the use of chemicals, on their adverse side effects and on safe handling techniques.

Aim and scope

To educate those persons involved in regular usage of hazardous chemicals of the dangers inherent in the use of chemicals and of the correct procedures for safe storage and handling of chemicals.

Description

Under this programme an adviser would work with the Environmental Health Division and Solomon Islands authorities responsible for the importation, sale and use of agricultural biocides and other hazardous chemicals. The adviser would address the following: the nature of the chemicals being used, their long- and short-term effect, safe handling procedures, and safe storage and disposal procedures. The programme would culminate in the preparation of appropriate information in both English and Pidgin on the use of specific chemicals in Solomon Islands, and establish administrative procedures for the routine dissemination of the information, including at all points of chemical sale. This programme would target especially those workers who are most at risk through frequent contact with chemicals.

Cost estimates

Technical assistance	
1-month review of chemicals used in SI	30,000
Preparation and publication of educational material	50,000
Publication of safety brochures	
for distribution to all purchasers at point of sale	60,000
Total costs *$SI* 140,000	

Executing agency

Environmental Health Division, MHMS. The Division would work closely with a wide range of Solomon Islands authorities, but particularly the Ministry of Agriculture and Lands and provincial governments.

Potential issues

Preparation of educational materials could be undertaken by the proposed Environmental Education and Information Unit (see 4.1.1).

Processing/timing

FY 1993 – FY 1994.

Programme profile ***7.4.1*** **Bushfire control campaign**

Aim and scope

a) To educate the public on the adverse environmental effects of lighting unnecessary grass fires, including air pollution and resulting respiratory problems.
b) To develop a grass fire protection capability for the Honiara town area and immediate environs.

Description

The programme would have two phases:

Phase 1

a) Prepare a public fire education programme, directed at both school children and adults, with production of media material;
b) provide technical assistance for assessment of losses involved from grass fires; and
c) provide technical assistance for assessment of fire suppression equipment needs.

Phase 2

a) Provide training for personnel of the Forestry Division and of the Honiara Municipal Authority in fire suppression techniques; and
b) provide equipment for fighting grass fires, dependent upon the assessment of needs in Phase 1.

Cost estimates

Phase 1	Anti-fire media campaign	20,000
	Technical assistance *for assessment of fire losses and suppression equipment needs*	30,000
	Total costs *$SI* **50,000**	
Phase 2	Budget will be dependent upon the findings of the needs assessment.	

Executing agency

Forestry Division, MNR, and Honiara Municipal Authority.

Potential benefits

Apart from improved public health, a reduced incidence of grassland fires will encourage the regeneration of woody species on the denuded hills around Honiara, thus improving the visual environment and assisting in the rehabilitation of the degraded soils.

Potential issues

Information for the anti-fire campaign could be developed by the proposed Environmental Education and Information Unit (see 4.1.1). If this unit is not established, additional funding will be needed for technical assistance to develop an anti-fire media campaign.

Processing/timing

FY 1996.

Programme Profile ***8.2.1***

Strengthen agricultural extension capability

Aim and scope

To increase the focus of agricultural extension activity on to subsistence food production.

Description

While not detracting from the continuing extension programme by the Agriculture Division for farmers growing cash crops for the export and domestic market, the programme would aim to strengthen the capability of the Agriculture Division's agricultural extension unit, to allocate considerably increased effort to providing support to landowners on the use of improved traditional agricultural systems which are agronomically productive, but which maintain soil and other values in the longer term.

The programme is seen initially as two years of technical assistance to fund the salary and on-costs of an existing Solomon Islands professional agriculturalist (and support staff) so he/she can devote maximum time to:

a) the seeking out, assembly and professional evaluation of traditional agricultural practices;
b) the development of improved food production practices based on those traditional systems;
c) the testing of the improved systems in the field; and
d) when systems have been field proven, the training of agricultural extension staff and wide promotion of the sustainable agricultural practices throughout Solomon Islands.

Cost estimates

It is believed this programme would be most cost effective in terms of both:

a) the potential for improved subsistence food production without long-lasting land or other environmental degradation; and
b) the use of only Solomon Islands staff on the programme.

Technical assistance	
2 years for SI professional agriculturalist	40,000
Hire of field assistants and labour	35,000
Internal travel costs	15,000
Publication of findings	10,000
Total costs *$SI* 100,000	

Executing agency Agriculture Division of the Ministry of Agriculture and Lands.

Potential benefits This programme could be regarded as complementary to the former Rural Services Project, but with increased emphasis on subsistence food production technology, especially home-grown traditional agricultural techniques.

Potential issues This programme will be best served by a Solomon Islander with agricultural training who has an in-depth knowledge of customary land tenure practices in various areas of Solomon Islands, and who can research and assemble knowledge on traditional agricultural practices. By application of his/her professional agricultural training, improved versions of those traditional practices can be developed which are tailored to an area and therefore more likely to be adopted by the landowners, once the value of the improved system is proved in the gardens. Because of the heavy responsibility of women for gardening in most areas, a woman would make an ideal programme leader. This should be considered in consultation with the recently commenced Women in Agriculture Extension Programme.

Processing/timing Funding of the salaried position to commence in FY 1992–1993, with further support funding once the detailed programme is developed.

Programme profile **9.2.1**

Customary landowner forestry awareness & traditional knowledge programme

Aim and scope

To develop a customary landowner awareness and information programme which will increase landowner knowledge and awareness of:

a) the value of forests on lands under their control;
b) appropriate forest management; and
c) documentation and use of traditional knowledge in forest management in Solomon Islands.

Description

This programme would cover a number of areas and would be divided into two closely related parts.

Part 1

This would involve the provision of information and advice to landowners and include:

a) information on the environmental and social implications of forest loss. In many instances there is no available information on the long-term implications of forest loss to balance against the short-term profits to be gained from the large-scale commercial use of the forest resource; and
b) information on post-logging options for forest areas proposed for logging. This information should be provided at an early stage, preferably before logging operations commence. In most cases logging is undertaken before landowners have clear viewpoints on the range of options that are available for the management of the land after logging operations have ceased.

Provision of the above information and advice would involve a range of approaches including: village-level seminars and workshops; the use of the local media such as radio, posters and information sheets; and the formal training of landowners to enable them to communicate messages to appropriate persons at the village level. Target areas for the awareness programme should be those where logging is proposed, but the programme would also involve a broader community-wide awareness campaign.

Customary land which is already being logged is being addressed by the existing Timber Control Unit Project. This provides information on the relevant legislation, on the Standard Logging Agreement and its implications to landowners, and on negotiating and dealing with representatives of logging companies and government.

The extension programme would be developed in-country using local staff at the National Forestry Training Institute (NFTI) at Poitete and the Forestry Division extension unit.

Part 2 This would involve the documentation of knowledge relating to the traditional use of forests, followed by an examination as to the possible incorporation of this knowledge into current forest management practices. This would focus on a specific case study area and aim to produce material, in both Pidgin and local languages, that would be generally applicable. The NEMS Seminar indicated that considerable traditional knowledge relating to forests and forest uses exists in Solomon Islands. This was considered to be an important resource which should be utilised in developing forest management strategies on customary land.

Cost estimates

Information and advice	
Extension programme development and training at NFTI, Poitete	60,000
Additional extension staff	40,000
Workshops	40,000
Equipment and supplies	40,000
Travel and per diem	60,000
Printing	35,000
Support to local office	25,000
Traditional knowledge	
Consultant — 4 months	80,000
Travel and per diem	20,000
Printing	10,000
Total costs *$SI* 410,000	

Executing agency Forestry Division, MNR.

Potential issues This programme would complement and work in co-operation with the existing Timber Control Unit Project and the proposed Environmental Education and Information Unit (see 4.1.1). There is considerable potential for the joint involvement of the Forestry Division and NGOs such as the Solomon Islands Development Trust (SIDT) in the implementation of the information and advice component of this programme. Wherever possible the awareness programme should be linked to existing and proposed reforestation activities on customary land. The traditional use component of this programme should be linked with similar programmes that are currently underway, such as the Marovo Lagoon Resource Management Project.

Processing/timing FY 1993 – FY 1994.

Programme profile **9.2.2**

Provincial & national government forestry awareness programme

Aim and scope

To improve awareness by provincial and national government officials of their roles and responsibilities under the forestry legislation.

Description

This programme would involve mini-seminars at the national and provincial level and would cover a number of areas, including introduction to the Forest and Timber Utilisation Act, roles and responsibilities under the Act, and mechanisms for co-ordination between the provincial and national governments. These seminars would address the current uncertainty that appears to exist in relation to respective roles at the various levels of Solomon Islands Government. They would also serve as a forum for provincial and national government representatives to meet and discuss mutual areas of concern in relation to forest management. It is anticipated that this programme would involve two national seminars and a seminar in each province.

Cost estimates

Travel, fares and allowances	40,000
Equipment and supplies	10,000
Total costs $SI 50,000	

Executing agency

Forestry Division, MNR.

Potential issues

This could be linked with other meetings or conferences where National and Provincial Government officials are programmed to meet.

Processing/timing

FY 1993 – FY 1994.

Programme profile ***9.3.1***

Expanded customary land reforestation programme

Aim and scope

a) To expand reforestation activity on customary land in selected areas where market prospects for roundwood and sawn timber appear assured.
b) To assist the existing customary land reforestation project to better meet the reforestation demand in Solomon Islands. Demand for reforestation greatly outweighs the project's ability to meet it. Reforestation is currently planned for areas in Malaita, Guadalcanal and Western Provinces, and potentially one other province.

Description

The current project is seeking to promote customary land reforestation through the establishment of demonstration forests for the supply of logs and timber, and to carry out a range of extension forestry activities such as agroforestry, fuel wood and sustainable forest management.

The programme would have four major components — extension, training, reforestation and investment — which would build on and expand the existing project. Extension activities require infrastructural support in the provinces such as transport and accommodation. Training programmes are on-going for both extension staff and landowners.

The reforestation component would continue to include specific programmes for encouraging reforestation on customary land. The investment component would include provision for:

a) the development of clear and accepted agreements;
b) developing guidelines for the encouragement of private sector involvement, where appropriate, in the development of reforestation projects; and
c) direct financial advice to landowners to enable them to maximise their returns from reforestation.

One additional area which an expanded programme might investigate is the feasibility of establishing a trust fund which would be available specifically to encourage reforestation.

Cost estimates

Estimated total cost is *$SI* **1.4 million** over a 5-year period. Loan assistance of about *$SI* 1.2 million is required to finance development bank loans for appropriate investment between the private sector and landowners. The customary landowners' land and some labour elements would provide their venture equity.

Executing agency

Forestry Division, MNR.

Potential issues This programme would also involve the Ministry of Agriculture and Lands and NGOs. The project would need to be developed in close consultation with the existing New Zealand-funded reforestation project and should be undertaken after the mid-term review of that project in 1994.

Processing/timing FY 1994 – FY 1998.

Programme profile ***10.3.1*** **Conservation of marine turtles**

Aim and scope To establish an effective marine and land conservation area to protect the important turtle nesting beaches in the Arnarvon group of islands.

Description This programme would entail the hire of legal expertise to develop an appropriate legal instrument and management regimes for the Arnarvon group. The programme would also involve the establishment of housing and water catchments, purchase of equipment, and cover programme running costs for the first five years (including wardens' salaries). Solomon Islands would be expected to pay subsequent running costs. At least two landowners would be trained as wardens for the area, and work on a rotational basis. A management plan would be formulated with full participation of landowners.

Cost estimates

Law expert to develop legal covenant *1 month, including travel costs*	40,000
Development of management plan	25,000
Training programme for wardens, and community education	10,000
Establishment of infrastructure	15,000
Equipment purchase *Includes canoe, outboard motor, solar panels, tagging and other scientific equipment*	40,000
Running costs for first 5 years *Includes salaries for two wardens, allowances, fuel etc*	120,000
Total costs $SI 250,000	

Executing agency Environment and Conservation Division and Fisheries Division, MNR.

Potential benefits Protection of one of the world's most important hawksbill turtle nesting grounds through establishment of a community-managed conservation area.

Potential issues Full consultation with the landowning groups is vital. After five years the programme should be reviewed. Training for wardens could be undertaken under SPREP's arrangement with the Queensland National Parks and Wildlife Service; under this arrangement one Fisheries Officer has already received training at Queensland's Heron Island Turtle Sanctuary.

Processing/timing Late 1992–1997.

Programme profile ***10.3.2***

Crocodile population monitoring

Aim and scope To monitor changes in crocodile populations.

Description Annual surveys of crocodile populations would be made in those areas identified (by the 1989 Crocodile Survey) as being important, in order to determine if numbers are recovering or further declining. For this programme to operate, government officers need to be trained in survey techniques. Follow-up training will be required for additional officers over a four-year period. The programme would also fund base operational costs for the first five years.

Cost estimates

Year 1	Technical assistance	
	1 month for training in survey techniques and field procedures	50,000
Year 2	Follow-up in-service training and operational support *for a further 4 years at $20,000 per annum*	80,000
	Total costs over 5 years $SI 130,000	

Executing agency Environment and Conservation Division and Fisheries Division, MNR.

Potential issues Because of a low retention rate of trained staff, it will be necessary to train two or three times the number of field monitoring staff required. The ECD staff member trained in survey techniques in 1989 has gone and there has been no further training.

Processing/timing 1993–1998.

Programme profile ***10.4.1*** **Reef management systems**

Aim and scope To establish reef management systems appropriate to Solomon Islands.

Description A feasibility study which will test approaches to reef management developed in other countries to assess their applicability to Solomon Islands marine tenure, and, if a system is considered suitable, to design a pilot implementation programme with a local community in one of the areas identified under Programme 5.1.4. The implementation of the pilot trial would constitute Phase 2 and require further small funding support.

Cost estimates

Phase 1 Technical assistance
3 months to examine reef management systems and design pilot programme **$SI 100,000**

Phase 2 Cost to be estimated in a review to be undertaken at completion of Phase 1

Executing agency Fisheries Division, MNR.

Potential benefits Identification of appropriate reef management systems which could be applied to areas of Solomon Islands.

Potential issues Further funding will need to be sought once the pilot programme is designed.

Processing/timing Phase I: 1995.

Programme profile ***11.1.1***

Coastal environmental management plans for Priority One Areas: Noro & Tulagi

Aim and scope To develop coastal environmental management plans for Noro and Tulagi addressing pertinent environmental issues.

Description This is a technical assistance programme to be conducted over a 12-month period with the local support of ECD. The development of the coastal environmental management plans would be based on surveys of coastal resources and their uses, analysis of existing and potential environmental issues, pollution monitoring, National and Provincial Government development priorities, and a study of coastal processes and natural dynamics in the vicinity of Noro and Tulagi. Plan preparation would be undertaken in full consultation with landowners and provincial and national authorities, and would, amongst other things, specifically address marine pollution problems, solid waste disposal, coastal erosion and mangrove degradation.

Cost estimates

Technical assistance by coastal resource management expert *12 months, including salary and on-costs*	160,000
Operational costs for SI support and counterpart team *Includes in-service training*	40,000
Rental support	12,000
Travel costs for team *External $25,000* *Internal $35,000* *including hire of transport*	60,000
Equipment	18,000
Total costs *$SI* 290,000	

Executing agency Environment and Conservation Division, MNR, with Town and Country Planning, MAL.

Potential benefits The plans would be the foundation for improved coastal management and minimisation of existing environmental problems.

Potential issues Coastal environmental management plans must be compatible with land tenure systems. ESCAP has offered to fund this programme, and its commencement is anticipated by late 1992.

Processing/timing 1992–1993.

Programme profile ***11.1.2***

Coastal environmental management plans for Priority Two Areas

Aim and scope

To develop coastal environmental management plans for the areas of Nggelas, Savo Is. (Central Province); Choiseul Bay (Choiseul Province); Marau Sound, Lambi, Visale (Guadalcanal Province); Kia (Isabel Province); Kira Kira, Waimaranga, Star Harbour (Makira Province); Langa Langa Lagoon, Lau Lagoon, Maramasike Passage, east Are'Are' and east Kwaio (Malaita Province); Duff Islands, Reef Islands, Graciosa Bay, Nupani Island, Nukapu Island (Temotu Province); Gizo, Viru Harbour, eastern Vangunu, Vella Lavella and Ringgi Cove (Western Province).

Description

This proposed programme would be a major undertaking if executed in a short time span. Consideration of less than two years is impractical, with the planning and undertaking of environmental surveys in each area the main constraint. The first step following field survey is prioritisation of the degree of environmental concern, taken with other factors, and would involve close consultation at National and Provincial Government levels with landowners. The experience gained during the development of Coastal Environmental Management Plans for Noro and Tulagi will be applied to this broader task, with anticipated increase in speed of environmental survey team operation.

Cost estimates

Technical assistance by coastal management planning expert and SI assistants — *2 years*	370,000
Travel for survey crew *Includes boat and plane hire*	70,000
Equipment *Field hire of labour and miscellaneous contingencies*	50,000
Total costs *$SI* **490,000**	

Executing agency

Environment and Conservation Division, MNR, with Town and Country Planning, MAL.

Potential benefits

a) Improved coastal management planning and utilisation of the resources of the coastal zone in these areas.

b) Mitigation or resolution of existing environmental problems.

Potential issues

Some resource inventory information may be collected as part of Programme 11.1.1, therefore commencement of this programme should await successful completion of Programme 11.1.1.

Processing/timing

1995–1996.

Programme profile ***11.2.1***

Mangrove documentation, protection & rehabilitation assessment

Aim and scope

This programme would have two phases. In Phase I the programme would:

a) document the existing extent and condition of mangroves/wetlands in Solomon Islands;
b) identify significant mangrove stands which require some form of protection;
c) identify mangrove areas which require rehabilitation; and
d) investigate the feasibility of community regeneration of mangrove areas.

Phase 2 would see the implementation of replanting/regeneration projects for identified problem mangrove areas.

Description

Phase I

This would entail air photo interpretation (API) of mangrove/wetland areas with supplementary ground survey. Some mapping of the existing extent of mangroves is being undertaken by the National Forest Resources Inventory. The aerial cover of the current resource would be compared with past distribution, as mapped by Hansell and Wall (1976). Degraded mangrove areas which are considered to require rehabilitation would be identified and the economic and environmental feasibility of such rehabilitation examined.

Phase 2

Implementation of replanting/rehabilitation of mangrove areas by local communities will require significant forestry extension activity with villagers by the Forestry Division.

Cost estimates

Phase I

Technical assistance — *12 months*	160,000
Travel	40,000
Equipment	20,000
Total costs *$SI* 220,000	

Phase 2

The budget for replanting/rehabilitation should be estimated on review of Phase I results.

Executing agency

Forestry Division in consultation with Environment and Conservation Division, MNR.

Potential benefits

a) Improved database on mangrove resources.
b) Rehabilitation of degraded mangrove areas, thus improving fisheries habitats and stabilising coastal processes.

Potential issues

Rehabilitation costs will depend on areas identified. Further funding will need to be sought for Phase 2. Rehabilitation/replanting will also be dependent upon the support of landowners; any proposed rehabilitation will be conducted in full consultation with landowners.

Processing/timing

Phase I: 1994–1995. Phase 2: 1996 – to be determined.

Programme profile **11.2.2**

Feasibility of sustainable utilisation of mangrove resources for fish-smoking

Aim and scope

To establish the feasibility of implementing a sustainable mangrove harvesting regime in the Noro–Munda area for the purpose of fish-smoking, or to determine alternative fuel sources.

Description

A small technical assistance programme would establish the rate of use of the mangrove species in New Georgia suited for fish-smoking, and assess whether that rate could be sustained. The study would attempt to assess natural increment rates as a means of determining the maximum sustainable rate of cut of the existing resource. The feasibility of establishing mangrove plantings expressly for fish-smoking and the need for restrictions on cutting activity would also be considered.

Cost estimates

Technical assistance — *1 month*	30,000
Travel/accommodation	6,000
Incidentals, minor equipment	3,000
Total costs $SI 39,000	

Executing agency

Forestry Division, MNR, in consultation with the South Pacific Trade Commission, Sydney.

Potential benefits

Promote sustainable utilisation of mangrove resources.

Potential issues

There may be resistance from vested commercial interests or from landowners to non-use of mangroves for fish-smoking. Any management plans for the mangrove areas would need to be developed in close consultation with interested parties. Commencement of this project should await completion of assessment of areas under Programme 11.2.1 or could be combined as a part of that programme.

Processing/timing

1996.

Programme profile 11.2.3

Mangrove case study & community education

Aim and scope

a) To quantify mangrove-dependent resources in a specific area and assess their value to the community.
b) To develop and disseminate educational materials on the function, importance and value of mangroves to local communities.

Description

This is a case study which would quantify, through resource inventory and community survey, the utilisation of mangrove-dependent resources in a selected area, identified through Programme 11.2.1. Educational material based on the findings of the case study would be produced and disseminated to local communities.

Cost estimates

Technical assistance	
2 months for resource inventory and community survey and associated travel costs	80,000
Production of educational material for publicity purposes	50,000
Total costs $SI 130,000	

Executing agency

Fisheries Division with Forestry Division, MNR.

Potential benefits

a) Increased public awareness of the function, importance and value of mangroves to Solomon Islands communities.
b) Resultant reduction in rate of degradation of mangrove resources, particularly from clearing for new housing settlements.

Potential issues

Commencement of this project should occur after completion of Phase I of Programme 11.2.1 so that a suitable area may be chosen. Isabel, Choiseul, and Western Provinces have indicated their interest in such a project occurring in their province. The proposed Environmental Education and Information Unit (see 4.1.1) would be responsible for the production of educational material. If this unit is not established, additional funding would be required for technical assistance to develop educational material.

Processing/timing

1996.

Programme profile ***12.1.1*** **Strengthen monitoring capacity for mining activity**

Aim and scope To upgrade the capacity of the Geology Division of MNR to monitor pollution from mining and related activities and other environmental impacts.

Description The programme would fund the recruitment of an environmental geologist for a two-year posting in Honiara to:

a) develop a practical monitoring programme;
b) upgrade the geology laboratory;
c) train staff in field sampling, laboratory testing and analytical procedure; and
d) establish a statistical baseline for the evaluation of pollutant levels.

Baseline statistics would concentrate on the evaluation of fluvial and marine pollution as a result of gold mining activity at Gold Ridge.

Cost estimates

Project preparatory technical assistance — *1992–1993*	20,000
Technical assistance for Environmental Geologist *2 years with administrative on-costs*	250,000
Accommodation support	25,000
Local funding for SI counterpart	30,000
Laboratory and field equipment *for water and mineral analysis*	400,000
Training of two laboratory staff	50,000
Travel — *2 years for monitoring staff*	45,000
Vehicle operation and other miscellaneous programme costs	50,000
Total costs *$SI* 870,000	

Executing agency Geology Division of MNR, with ECD, MNR.

Potential benefits Strengthened environmental monitoring capability in the area of natural non-living resources, particularly minerals and water.

Potential issues The long-term effectiveness of the programme will hinge on the ability to secure a Solomon Islands counterpart for the environmental geologist, and on the recruitment of additional staff for the efficient operation of the geochemical laboratory. The Geology Division is independently preparing a major proposal for the upgrading of the geochemical laboratory, which should be taken into account.

Processing/timing The training is urgently required. Programme proposal submission to be developed for consideration in 1993; project start-up in FY 1994–1995.

Programme profile ***12.2.1***

Pilot trial of solar power electricity supplementation (to diesel electricity generation)

Aim and scope

To test technology developed in Australia for supplementing diesel power generation of electricity in remote communities with solar power generation. This entails the introduction to Solomon Islands of new developments in both solar cell and accumulator technology.

Description

The project would require short-term technical assistance for the design of a system suitable for trial in a provincial town. Cost estimates include equipment purchase, installation, and training.

Cost estimates

Technical assistance — *3 months*	50,000
Equipment purchase, transport and installation in SI	40,000
Training costs *Includes travel, labour hire, miscellaneous costs*	30,000
Total costs *$SI* **120,000**	

Executing agency

Energy Conservation Section of the Energy Division.

Potential benefits

Possible significant savings in the supply of electricity to provincial towns through reduction in usage of imported diesel fuel.

Potential issues

There are a number of organisations which specialise in low-cost technology, including the UK Natural Resources Institute, ODA. Advice could also be sought from well-known commercial research groups such as BP Solar (in Australia), and from public bodies, such as the Power and Water Authority in the Northern Territory of Australia (Darwin) which has conducted trials of solar supplementation for remote townships there.

Processing/timing

1995–1996.

Participants in the National Environmental Management Strategy Seminar 19-21 November 1991

Provinces

Central Province

Tony Bauro
(Acting) Provincial Secretary
Tulagi

Norman Sao
President
West Rennell Area Council

Godfrey Narasia
Project Planning Officer
Tulagi

Choiseul Province

Lennis Rukale
Chief Administration Officer
Gizo

Guadalcanal Province

David Vouza
President
Bolomono Area Council

Victor Totu
Director of Cultural Centre
Guadalcanal

Philip Theodi
Chief Health Inspector
Guadalcanal Province

Thornley Hite
Deputy Provincial Secretary
Guadalcanal

Isabel Province

Phillip Manehatha
Premier
Isabel Province

Peter Hauia
(Acting) Provincial Secretary
Isabel Province

Makira Province

Robert Berra
Provincial Secretary
Makira Province

Claudius Susumana
Maniwiriwiri Area Council
Makira Province

John Campbell
Vice President
Boro Area Council

Malaita Province

Jack Watealaha
(Acting) Provincial Secretary
Malaita Province

Paul Kenioriana
Senior Administration Officer
(Extension)
Malaita Province

Henry Dora
Deputy Premier
Malaita Province

Temotu Province

Fr John Lapli
Premier
Temotu Province

Raymond Suinao
(Acting) Provincial Secretary
Temotu Province

John Tauto
President
Nambakaenga Area Council

John Peter Noli
Chief Field Officer (Agriculture)
Temotu Province

Western Province

Tebano Bobai
Provincial Secretary
Western Province

Catherine Cole
Cultural Affairs Adviser
Western Province

Robert Moses
Physical Planner
Western Province

Honiara Municipal Authority

Levi Laka
Town Clerk
Honiara

Sectors

Ministry of Natural Resources

Walter Ramo
Permanent Secretary

♦ *Environment & Conservation*

Henry Isa
Principal Conservation Officer

Bernard Telei
Senior Environment Officer

Tanya Leary
Wildlife Ecologist

♦ *Forestry*

Samson Gaviro
Commissioner of Forests

Eddie Doliano
Principal Forestry Officer
(Logging & Timber Control)

Aiden Beveni
Principal Forestry Officer
(Reforestation)

Tim Thorpe
Forestry Adviser
(Customary Land
Reforestation Project)

Hilton Taylor
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♦ *Fisheries*

Albert Wata
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Edwin Oreihaka
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(Provincial Fisheries
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Kitchener Collinson
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Gordon Darcy
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Ministry of Agriculture & Lands

♦ *Agriculture*

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Zimma Hughes
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Ministry of Tourism & Aviation

Ben Devi
Chief Tourism Officer

Ministry of Education & Human Resources Development

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Hilda Kii
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Economic Planning

Hilda Vahia
Chief Finance Officer
Budgets

Ministry of Transport, Works & Utilities

No representation

Ministry of Provincial Government

Pattison Oti
Permanent Secretary

Emilio Bulu
Under-Secretary

Ministry of Home Affairs

Hugh Wheatley
(Acting) Under-Secretary

Redly Lapo
National Museum of Solomon Islands

Ombudsman's Office

Frank Pororara
Ombudsman

Attorney General's Chambers

John Hauirae
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Office of the Prime Minister

Walton Abuito'o
Deputy Head
Policy Evaluation Unit

Non-Governmental Organisations & Others

- *Development Services Exchange*

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  General Secretary

- *Solomon Islands Development Trust*

  Abraham Baeanisia
  Director

- *Forum Fisheries Agency*

  Transform Aqorau
  Legal Officer

- *Central Bank of Solomon Islands*

  Ishmael Wore
  Research Officer

  Denton Rarawa
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- *Solomon Islands Planned Parenthood Association*

  Cherry Galo
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  Joseph Wale
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Resource people

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Summary table of costs for strategy implementation

3.0 Integrating environmental considerations in economic development

	Strategy/programme title & description	*Timing*	*Executing agency*	*Cost $SI*
3.1	Adopt an integrated approach to environmental policy & planning	1992 on-going	OPM, MNR, MAL, MFEP	
3.2	Submit proposed policies, development programmes & projects to environmental impact assessment (EIA)		OPM	
	***3.2.1** Standard EIA guideline development for national & provincial governments*	*late 1992–1993*	*OPM in consultation with MPG & ECD*	*160,000*
3.3	Introduce a comprehensive framework of national & provincial environmental law, together with the means for its enforcement in a communally acceptable manner	in progress commenced 1991	ECD, MPG, AG	
3.4	Review adequacy of institutional mechanisms & administrative controls	in progress	ECD, OPM & Public Service	RETA
3.5	Institute resource pricing in the National Accounts & other economic policy for achieving sustainability	1993	MFEP & OPM	

In this table (and throughout the document), some programmes have been marked with an asterisk (*). This indicates that a brief profile has been prepared for that specific programme. These profiles are found in Appendix 1.

4.0 Improving environmental awareness & education

	Strategy/programme title & description	Timing	Executing agency	Cost $SI
4.1	Review & upgrade the status of environmental education in Solomon Islands			
	* **4.1.1** *Establishment of an Environmental Education & Information Unit*	*1992–1997 on-going*	*ECD*	*530,000*
	* **4.1.2** *Provincial environmental awareness workshops*	*1993–1994*	*ECD, MPG & provincial governments*	*430,000*
	* **4.1.3** *Curriculum development in environmental education for primary & secondary schools*	*1993–1994*	*MEHRD & ECD*	*170,000*
	4.1.4 *Curriculum development for religious seminaries*		*dependent on each religion*	
	* **4.1.5** *Development of environmental fact sheets, educational resources & visual aids*	*1992–1993*	*MEHRD & ECD*	*80,000*
	4.1.6 *Environmental awareness training for government extension officers*	*1993 on-going*	*ECD*	
4.2	Preserve traditional knowledge & management systems			
	* **4.2.1** *Documentation of traditional knowledge & management systems*	*1994–1996*	*National Museum with provincial cultural offices*	*410,000*
	* **4.2.2** *Application of traditional knowledge & management systems*	*1996*	*National Museum in consultation with MNR & MAL*	*160,000*

5.0 Strengthening the resource database

	Strategy/programme title & description	Timing	Executing agency	Cost $SI
5.1	Resource surveys			
* 5.1.1	*Ecological survey of terrestrial vertebrate fauna*	*Phase 1 1993–1994 Phase 2 1995–2000*	*ECD*	*3.04m (total cost Phases 1 & 2)*
* 5.1.2	*Systematic botanical survey*	*Phase 1 1993–1994 Phase 2 1995–2000*	*FD*	*2.685m (total cost Phases 1 & 2)*
* 5.1.3	*Dugong survey*	*1993–1994*	*Fisheries Division & ECD*	*170,000*
* 5.1.4	*Reef, estuary & lagoon resources survey*	*1993–1994*	*Fisheries Division*	*450,000*

6.0 Protecting areas of high ecological, wilderness & cultural value

	Strategy/programme title & description	Timing	Executing agency	Cost $SI
6.1	Develop conservation areas & reserves			
	* **6.1.1** *Development of a conservation areas system*	*1994*	*ECD*	272,000
	6.1.2 *Participation in regional & international biodiversity programmes*	*on-going*	*ECD*	
	* **6.1.3** *Identification of areas of conservation significance*	*1995–1997*	*ECD*	*550,000*
	* **6.1.4** *Development of a model conservation area with full landowner participation — Komarindi Conservation Area*	*1993 on-going*	*ECD*	*261,000-573,000*
6.2	Promote eco-tourism			
	* **6.2.1** *Nature sites development*	*1991–1993*	*MTA with TCSP*	*Funding allocated*
	* **6.2.2** *Proposed World Heritage Sites: Lake Te Nggano & Marovo Lagoon*	*1990–1994*	*MTA in consultation with ECD & Rennell & Marovo communities*	*Funding allocated*

	Strategy/programme title & description	Timing	Executing agency	Cost $SI
6.3	Protect & manage wildlife			
	* **6.3.1** *Regulation & monitoring of wildlife trade*	*1992 on-going*	*ECD & AG*	*220,000*
	* **6.3.2** *Insect farming & establishment of Insect Trading Agency*	*1993*	*MCTPI in consultation with MAL*	*50,000*
	* **6.3.3** *Feasibility study of farming other species of wildlife*	*1993*	*MCTPI in consultation with ECD*	*40,000*
	* **6.3.4** *Population survey of parrot species currently subject to trade*	*1993*	*ECD*	*200,000*
6.4	Protect biological diversity			
	* **6.4.1** *Costs & benefits of conservation of biological diversity in Solomon Islands*	*1992*	*ECD with SPREP*	*150,000 funding allocated*

7.0 Improving waste management & controlling pollution

	Strategy/programme title & description	Timing	Executing agency	Cost $SI
7.1	Improve disposal of solid wastes & sewage			
	* **7.1.1** *Improved solid waste disposal programme*	*1994–1996*	*Env. Health Division (MHMS), HMA & provincial governments*	*1.7m*
	* **7.1.2** *Waste disposal education*	*1993–1995*	*HMA & ECD*	*30,000*
7.2	Reduce pollution from industrial processing			
	* **7.2.1** *Strengthen monitoring of industrial wastes*	*1992*	*ECD*	*80,000*
	* **7.2.2** *Pollution monitoring design for the Noro fish processing facilities*	*1993*	*ECD*	*100,000*
7.3	Use & abuse of biocides & other hazardous chemicals			
	* **7.3.1** *Educational programme on the proper use & control of chemicals*	*1993–1994*	*Env. Health Division (MHMS)*	*140,000*
	7.3.2 *Disposal of stocks of unwanted biocides*			
7.4	Reduce air pollution in town areas			
	* **7.4.1** *Bushfire control campaign*	*1996*	*FD & HMA*	*50,000*
	7.4.2 *Dust control campaign*			

8.0 Land resource management (excluding forestry)

	Strategy/programme title & description	*Timing*	*Executing agency*	*Cost $SI*
8.1	Protect the best soil for food crop production	on-going	MAL	
8.2	Promote efficient forms of traditional agroforestry practice	on-going	MAL	
	* ***8.2.1*** *Strengthen agricultural extension capability*	*1993*	*Agriculture Division*	*100,000*
8.3	Protect water supply catchment areas		MPG & provincial governments	

9.0 Sustainable use of forest resources

	Strategy/programme title & description	*Timing*	*Executing agency*	*Cost $SI*
9.1	Promote sustainable forest management (existing FD National Forest Resources Inventory & Timber Control Unit Project)	commenced 1991		
9.2	Improve community awareness & information			
	* **9.2.1** *Customary landowner forestry awareness & traditional knowledge programme*	*1993–1994*	*FD*	*410,000*
	* **9.2.2** *Provincial & national government forestry awareness programme*	*1993–1994*	*FD*	*50,000*
9.3	Increase reforestation			
	* **9.3.1** *Expanded customary land reforestation programme*	*1994–1998*	*FD*	*1.2 million*

10.0 Sustainable use of marine resources

Strategy/programme title & description	Timing	Executing agency	Cost $SI
10.1 Ensure equitable & sustainable economic return to the nation from commercial fishing	on-going	Fisheries Division & MFEP	
10.2 Reduce over-harvesting of reefs & lagoons			
10.2.1 *Guideline development for controlled harvest of reef & lagoon resources (to arise from 5.1.4)*	*1995*	*Fisheries Division*	
10.2.2 *Promote aquaculture & mariculture efforts*	*on-going*	*Fisheries Division & ICLARM*	
10.3 Protect endangered marine species			
* ***10.3.1*** *Conservation of marine turtles*	*1992–1997*	*Fisheries Division & ECD*	*250,000*
* ***10.3.2*** *Crocodile population monitoring*	*1993–1998*	*Fisheries Division & ECD*	*130,000*
10.3.3 *Creation of marine reserves*	*on-going*	*Fisheries Division & ECD*	
10.4 Protect the reef fishery habitat			
* ***10.4.1*** *Reef management systems*	*Phase I: 1995*	*Fisheries Division*	*100,000*

11.0 Coastal environment management

Strategy/programme title & description	Timing	Executing agency	Cost $SI
11.1 Coastal environmental management plans			
* **11.1.1** *Coastal environmental management plans for Priority One Areas: Noro & Tulagi*	*1992–1993*	*ECD & Physical Planning, MAL*	*290,000 ESCAP offered*
* **11.1.2** *Coastal environmental management plans for Priority Two Areas*	*1995–1996*	*ECD & Physical Planning, MAL*	*490,000*
11.2 Maintain mangrove resources			
* **11.2.1** *Mangrove documentation, protection & rehabilitation assessment*	*Phase 1 1994–1995 Phase 2 1996 on*	*FD & ECD*	*220,000 Phase 2: to be determined*
* **11.2.2** *Feasibility of sustainable utilisation of mangrove resources for fish-smoking*	*1996*	*FD*	*39,000*
* **11.2.3** *Mangrove case study & community education*	*1996*	*Fisheries Division with Forestry Division*	*130,000*

12.0 Environmentally safe exploitation of non-living resources

Strategy/programme title & description	Timing	Executing agency	Cost $SI
12.1 Ensure minimal damage from mineral exploration & extraction			
* **12.1.1** *Strengthen monitoring capacity for mining activity*	*1994–1995*	*Geology Division & ECD*	*870,000*
12.2 Promote alternative forms of energy to imported fossil fuels			
* **12.2.1** *Pilot trial of solar power electricity supplementation (to diesel electricity generation)*	*1995–1996*	*Energy Division*	*120,000*

About National Environmental Management Strategies — NEMS

Recent times have witnessed increasing threats to Pacific environments, coupled with an increasing awareness of the need for action. National Environmental Management Strategies (NEMS) are a measure of this awareness and a positive response to these threats.

NEMS, being developed in a number of Pacific countries, outline the major environmental issues faced by each country and identify the steps required to address them. There has been a strong emphasis on the identification of clear, fully costed programmes in each of these steps.

These NEMS have been developed in each country through a process of extensive in-country consultation and gathering of relevant background information. The end result is a document which "belongs" to the government and people of each country. The effective implementation of NEMS will be essential for sustainable development of the region and will involve all relevant organisations.

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