DRAFT

A Review of Environmental Education in the Formal School System:

Cook Islands, Fiji, Kiribati, Samoa and Vanuatu

CIP
ISBN

Report prepared by Seema Deo

Report commissioned by the Secretariat of the Pacific Regional Environment Programme (SPREP) with funding from the Regional Office for Asia-Pacific, United Nations Environment Programme (UNEP), Bangkok, Thailand

Secretariat of the Pacific Regional Environment Programme (SPREP)
PO BOX 240,
Apia
Samoa
Email: sprep@sprep.org
T: +685 21 929
F: +685 20 231

Website: www.sprep.org

TABLE of CONTENTS

LIST OF BOXED TEXT

Acronyms

AusAID	Australian Agency for International Development
CAU	Curriculum Advisory Unit
CDRC	Curriculum Development Resource Centre (Kiribati)
CDU	Curriculum Development Unit
CROP	Council of regional Organisations in the Pacific
EE	environmental education
ECD	Environment and Conservation Division (Kiribati)
ESD	education for sustainable development
FSPK	Foundation for the Peoples of the South Pacific Kiribati
HOPE	Helping Our Planet Earth
MNRE	Ministry of Natural Resources and Environment (Samoa)
NESAF	National Environmental Strategic Action Framework
NES	National Environment Service (Cook Islands)
NGO	non-governmental organisation
NSDP	National Sustainable Development Plan
SPC	Secretariat of the Pacific Community
SOPAC	Secretariat of the Pacific Applied Geoscience Commission
SPREP	Secretariat of the Pacific Regional Environment Programme
USP	University of the South Pacific
UNDP	United Nations Development Programme
UNEP-ROAP	United Nations Environment Programme, Regional Office for Asia-Pacific
UNESCO	United Nations Education, Scientific and Cultural Organization
UNICEF	United Nations International Children's Fund
WWF	World Wildlife Fund for Nature

Acknowledgments

The preparation of this report required the input of a vast number of individuals and organisations. It is not possible to name everyone but special thanks are due to the following:

- Cook Islands National Environment Service
- Departments of Education in Cook Islands, Fiji, Kiribati, Samoa and Vanuatu
- Division of Environment, Vanuatu
- Environment and Conservation Department, Kiribati
- Live and Learn Environmental Education, Fiji
- Live and Learn Environmental Education, Vanuatu
- Ministry of Environment, Fiji
- Ministry of Natural Resources and Environment, Samoa
- Principals and teachers from schools in Cook Islands, Fiji, Kiribati, Samoa and Vanuatu
- Secretariat of the Pacific Regional Environment Programme
- Wan Smolbag Theatre, Vanuatu

Chapter 1: Introduction

Purpose of the study

Few studies[1] have been published on school-based environmental education (EE) in the Pacific islands, and there is little available information on effective initiatives in schools. The key purpose of this study is to review and assess the extent to which EE is being carried out in Pacific Island schools to support ongoing dialogue about environment and sustainable development education at the national, regional and international levels.

The study was conducted in five Pacific Island countries: Cook Islands, Fiji, Kiribati, Samoa and Vanuatu. Each of these has had significant previous involvement in regional education-related activities supported by the Secretariat of the Pacific Regional Environment Programme (SPREP). With the exception of the Cook Islands, all countries have largely independent, nationally driven education systems. Three of the countries — Kiribati, Samoa and Vanuatu — are classified as Least Developed Countries and have been the recipients of a considerable number of loans and other financial and technical aid in the education sector.

The chief sources of information used to carry out this study and assessment include:

- A SPREP 2003 review of environmental education in the Pacific Islands
- SPREP Environmental Education Officer travel reports (1998–2004)
- National Curriculum Statements and related documents
- Country visits involving observations, document reviews and interviews with teachers, school heads, government officials, non-governmental organisations
- The reviewer's own experiences as SPREP's Education and Awareness Officer from 1998–2004

This study was commissioned by SPREP in partnership with the Regional Office for Asia-Pacific of the United Nations Environment Programme (UNEP-ROAP).

[1] Available information includes Bektas 1992; Muralidhar 1989; SPREP 1999 a, b (unpublished reports); Taylor 1993; Taylor and MacPherson 1993; and Taylor and Topalian 1995.

Scope of the study

This study reviews and analyses the status of school-based EE in five Pacific Island countries. In all cases, the study was limited to the most accessible (generally, urban) areas of the countries. Rural-based and outer-island schools were not addressed in this study mainly due to time and financial constraints. It is recognised that the needs, priorities and challenges of rural and outer island schools differ significantly from those of urban schools. Many rural schools do not have electricity, sufficient numbers of teachers, and adequate teaching resources. At the same time, it is also acknowledged that children in rural areas tend to be more exposed to the natural environment and many participate in conservation and related activities as part of ongoing community programmes. These schools deserve separate consideration and the findings of this study do not necessarily reflect the experiences of rural and/or outer-island schools.

While many “pilot” or “demonstration” programmes are conducted in schools by any number of non-governmental organisations (NGOs) and other agencies, no comprehensive lists were available. This study does not attempt to identify all of these programmes and activities, although those that were mentioned by schools are highlighted in this report.

Report structure

This report contains five chapters: Chapter 2 provides background information on EE and education for sustainable development (ESD), Chapter 3 outlines key findings of reviews undertaken in the five countries studied, Chapter 4 provides a discussion of research findings, and Chapter 5 summarises recommendations for future action.

Chapter 2: Environmental education in the Pacific: Overview

The many facets of EE

A 1970 report by the World Conservation Union (IUCN 1970) first defined EE as:

> a process of recognizing values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the inter-relatedness among man, his culture, and his biophysical surroundings. EE also entails practice in decision-making and self-formulation of a code of behaviour about issues concerning environmental quality.

In 1977, the world's first Intergovernmental Conference on Environmental Education in Tbilisi, Georgia established three broad goals for EE:

- Foster clear awareness of, and concern about, economic, social, political and ecological interdependence in urban and rural areas;
- Provide every person with opportunities to acquire the knowledge, values, attitudes, commitment and skills needed to protect and improve the environment; and
- Create new patterns of behaviour in individuals, groups and society as a whole towards the environment.

It is generally agreed on that for these goals to be achieved, EE needs to focus on developing skills in the following areas: problem-solving, decision-making and participation, values clarification and futures thinking (Palmer 1998, Tilbury and Wortman 2005). The ultimate aim of EE, as articulated by Palmer (1998:143), is "for every citizen to have formulated for him or herself a responsible attitude towards the sustainable development of the Earth, an appreciation of its resources and beauty, and an assumption of an environmental ethic."

In practice,however, EE tends to be interpreted and approached in different ways by teachers, school principals and curriculum developers. There are three distinct types of EE:

1. Education *about* the environment, which is knowledge-based and encourages the learning of facts and processes about the environment (i.e. environmental science or environment studies);

2. Education *in* the environment, which focuses on instilling in learners an appreciation for the environment by providing them with opportunities to learn within the natural environment (often associated with nature studies, field studies and outdoor activities); and
3. Education *for* the environment, which encourages learning how to take action and make appropriate changes to help protect or better manage the environment.

In theory, education *for* the environment is critically reflective, whereby the learner makes decisions based on their own analysis of a situation. In practice, however, education for the environment usually involves students taking predetermined actions such as tree planting or cleanups. Some educators argue that education *for* the environment is too simplistic and may give students false hope that all environmental problems are easily solved by simple actions (e.g. Breiting et al. 2005). They suggest that truly effective EE must address the political processes that are involved in environmental decision-making such as “negotiation, lobbying, persuasion, bribery and so on” (Fien 1993:42). Without this, EE may only produce young people who have no real power to bring about any kind of environmental reform and EE will remain simply another subject that students must learn and teachers must teach.

The current dialogue on education for sustainable development adds a further dimension to this debate.

Education for sustainable development — a process of change

Education for sustainable development (ESD) has been defined as an “emerging but dynamic concept that encompasses a new vision of education that seeks to empower people of all ages to assume responsibility for creating a sustainable future” (UNESCO 2002).

ESD is a far-reaching concept aimed at changing the way people think and live, as well as eventually changing social, economic and political structures to bring about more equitable and just societies. ESD in effect, challenges society to reconsider current models of development, economic growth and even the way we manage our environment. It encourages long term, “big picture” thinking that acknowledges that issues relating to environment, peace, health, democracy, economic independence and human rights are all inextricably linked. Environmental management and conservation is one pillar or component of the vast concept of sustainability. EE, therefore, is considered an integral element of ESD.

ESD requires the application of learning approaches that enable people to:[2]

- Learn to reflect critically on their place in the world and what sustainability means to them and to those around them;
- Envision alternative ways of living (alternative futures) and determine what their own vision is;
- Work with each other to negotiate different visions and determine pathways for achieving these; and
- Learn to think in a systemic, holistic manner that will allow them to see other perspectives and understand different interactions.

[2] Sourced from Draft United Nations Economic Commission for Europe Strategy on ESD presented at the 2nd Regional Meeting on ESD, Rome, July 2004. CEP/AC.13/2004/8/Add.1 18 May 2004

Chapter 3: Reviewing environmental education in formal school systems: Cook Islands, Fiji, Kiribati, Samoa and Vanuatu

Issues addressed in this study

- National policies and curriculum
- School culture and organisation
- Teaching and learning processes
- Resource and expertise availability
- Extra-curricular activities and external relations

National policies and curriculum

It is generally agreed that any school-based subject must be well integrated into the curriculum if it is to be given adequate priority by teachers. In the case of EE, reviews in other countries suggest that the curriculum focus on EE (where it exists) tends to be on student learning about the environment and is, therefore, generally placed within the sciences and social sciences (Tilbury and Garlick 2005). In other cases, EE may be mentioned as part of an overall education policy but is not actively assessed, often meaning that it is therefore not implemented. The following questions were used to guide the investigation of curriculum and policy.

- Are there national policies that recognise the value and importance of EE to the overall development of the country?
- Is EE a mandatory part of the curriculum?
- What interpretation of EE appears to guide the policy and/or curriculum content (i.e. education *about*, *in* or *for* the environment)?
- Does the overall curriculum specify development of analytical, investigative, critical thinking, communication and decision-making skills? Does the curriculum and/or policy encourage action (e.g. students learning how to become actively involved in problem solving through participation, discussion and negotiation)?

School culture and organisation

The culture of a school, as with any community, is integral to how issues are interpreted and how change is managed. In the case of EE, school culture also plays an essential part in developing positive environmental ethics among students. The development of any ethics or values requires that the entire school culture also reflect these same ethics and values. Therefore, regardless of the subjects being taught, teachers need to integrate these ethics into their overall teaching programme (for example, by modelling this in their own behaviour, and in what they choose to teach). For this approach to work, teachers need to feel comfortable within the school and must believe in the same ideas.

A school's culture is determined, at least in part, by its existing policies (including recruitment policies), principal, board, parent body, staff, students, and the surrounding community and its general environs. While it was beyond the scope of this study to fully analyse the culture of each school, this report considers a series of questions that reflect the overall school culture and allow broad observations to be made. The following questions guided the survey:

- Is there evidence of a school-wide environmental policy (e.g. waste disposal, composting, recycling, tree planting, water and/or electricity conservation)?
- Are all staff members involved in decision-making?
- Does the school apply principles of a "learning organisation"? Do the principal and teachers employ a critically reflective approach to all school activities?
- Are there mechanisms in place for student participation in decision-making or other change process (e.g. Is there an active student council, or an environmental committee?)
- Is there evidence of a peer support network among teachers? Are there professional development opportunities for teachers?

Teaching and learning processes

It is not sufficient to simply write environmental content into a curriculum. The way in which teachers encourage learning among students is equally (if not more) important. The very definition of education for the environment suggests that students must do more than learn facts and concepts. Action, participation and decision-making are not skills that can be taught through textbooks in the classroom. More active, learner-centred methodologies must be applied. The study addresses whether this is already taking place, and if not, what scope there is for this to happen.

- Do teachers exhibit a clear understanding of EE?
- Is special time allocated in the school programme for learning EE (or any other adjectival education)?
- What opportunities are there for critical thinking and reflection (e.g. how often are students challenged to question issues and ideas; do students keep journals or other records of their learning experiences)?
- Are students encouraged to develop their own solutions to perceived problems?
- Do teachers make an attempt to bring local and global relevance to their lessons?
- What assessment mechanisms are there?

Resource and expertise availability

A common complaint among teachers is the lack of relevant resources and information on EE. At the same time, there is a proliferation of information packages, education kits, videos, story books, comics, posters and pamphlets on almost any environmental issue currently deemed a priority. These materials are being produced nationally by governments and NGOs and regionally by regional and international organisations, but there is little information available regarding whether or how these materials are reaching schools or being used by teachers. Addressing such questions requires a separate in-depth survey, but the following questions helped identify present teacher needs, and provides an indication of the degree to which both nationally and regionally produced materials are reaching their targets. Availability of human resources (expertise) was also considered in this section.

- What EE teaching resources are available in the school (including education kits, packages, posters)?
- How are the available resources used?
- What systems are in place to catalogue and maintain the resources?
- Is there a budget provision for EE?
- Do teachers have access to (and use) the Internet and other media?
- Is EE expertise readily available?
- What sort of resources do teachers consider they require?

Extra-curricular activities and external relations

It is generally agreed that most successful environmental learning occurs when students are actually engaged in activities. This may involve generating, managing and analysing environment-

related information (such as measuring water quality), or it may be more complex, with the students participating in bringing about a change process (e.g. reducing water usage in the school or working with industry to reduce pollution of a waterway). Such involvement is generally not initiated by the school itself, but by external organisations that have developed the programme (together with appropriate resource materials). Schools participate in the programme by choice rather than in response to any requirement by the Ministry of Education. This study considered such programmes in the context of Pacific Island schools and how well they are integrated into the school system.

- Are there opportunities for students to participate in non curriculum-based programmes?
- How are these programmes organised and run?
- What teacher involvement is there?
- Does the school actively seek to involve external partners?

Environmental education in Cook Island schools (Rarotonga)

Background

The Cook Islands *National Sustainable Development Plan (NSDP), 2007–2015: Te Kaveinga Nui*, states the national vision as follows:

> To enjoy the highest quality of life consistent with the aspirations of our people, and in harmony with our culture and environment.
> (Government of the Cook Islands 2006)

The plan highlights the need for community acceptance and support for resource management, and outlines a specific target: to incorporate Cook Islands life skills, language, environmental and cultural content into national curriculum materials by 2010.

The National Environmental Strategic Action Framework (NESAF) prescribes specific activities for environmental and resource management in the Cook Islands. Training and education are identified as a priority for overall implementation of the NESAF and to improve environmental management. More specifically, the immediate proposed strategic actions within the NESAF relate to developing the scientific, technical and regulatory skills of various groups in environmental management and conservation.

EE in the Cook Islands has traditionally been the responsibility of the Cook Islands National Environment Service (NES). However, several other government[3] and civil society organisations[4] are also involved in school-based EE. While significant progress has been made in increasing the overall awareness and interest of the community in environmental matters, the lack of a cohesive approach to EE has resulted in duplication of efforts, confusion within the community and between the different environmental groups, and potentially wasted resources.

Recognising the urgent need for coordination among the different organisations, government and civil society groups together developed *Te Kaveinga Ora no te Aorangi: A Strategy for EE in the Cook Islands*. The strategy has been endorsed by the Cook Islands World Wide Fund for Nature

[3] Government agencies include the Natural Heritage Trust, Department of Fisheries and the Meteorology Services.
[4] Key civil society groups include the Cook Islands World Wide Fund for Nature (WWF), Taporoporo'anga Ipukarea Society, Rarotonga Environment Awareness Program (REAP), and the Takitumu Conservation Area.

(WWF), NES, the Curriculum Advisory Unit of the Ministry of Education, and the Cook Islands Association of Non-Governmental Organisations. It provides the first steps towards a coherent approach to EE in the country and attempts to link schools with the community on education and awareness projects. WWF is using the strategy to guide its work in the Cook Islands. Other organisations currently act as partners but have not actively integrated the strategy into their own planning.

National curriculum and policy

School attendance is compulsory (although not enforced) for all Cook Islands children aged 5–15 years. The government provides free education for primary and secondary school levels and some financial assistance to independent schools. The Cook Islands Curriculum Framework was developed in 2002 for all school levels and provides the foundation for curriculum development for all year levels.

The Cook Islands Curriculum Framework states that the goal of education is to:

> "…build the skills, knowledge, attitudes and values of its people to ensure the sustainability of the language and culture of the Cook Islands, and its economic growth, and to enable the people of the Cook Islands to put their capabilities to best use in all areas of their lives."
> (MOE 2002)

Although EE is not specifically mentioned, the curricula for several subjects specifically mention environment and sustainability issues and the need to address these using more contemporary learning methodologies.

The science and social science curricula have a substantial focus on developing an understanding of the natural environment and of conservation, especially from a traditional perspective. There is emphasis on the *raui* (conservation system) and use of plants for medicine, food and crafts. The social science curriculum states that students will be expected to "learn about their present society and the role they will play in it, politically, economically and environmentally, as responsible citizens." It goes on to suggest that, by having a secure knowledge of their heritage, beliefs and lifestyle, which identifies them as Cook Islanders, youth will "have the ability to stand firm, stand tall and be aware, and make an effective contribution to an ever changing Cook Islands society." The

science curriculum is more focused on building scientific knowledge and skills, although it also provides opportunities for investigating people's beliefs, attitudes, values, ethics and their influence on environmental issues

The Cook Islands Maori curriculum echoes these aspirations and speaks of developing a "sense of belonging to the culture and understanding of the language, values, beliefs, traditions and customs that form our Cook Islands culture, secure in the knowledge that they make a valued contribution to society."

School culture and organisation

EE policy

With the exception of one independent school (see Box 1), the schools surveyed for this review do not have a written policy on EE. However, school heads and teachers are demonstrated a high level of awareness of environmental issues in Rarotonga and many schools participate in recycling, tree planting, and cleanup programmes. Almost all schools participate in external competitions and other events organised outside the school system.

Decision-making processes

All schools mentioned having regular staff meetings that provide opportunities for teachers to have input to school operations. Teachers are free to develop their own programmes and be innovative in their teaching approaches. It is evident also that the interest and involvement of the school head is one of the main drivers for environmental involvement — where school heads showed interest in or knowledge of environment matters, there was a corresponding heightened environmental focus within the school.

All schools have a system of prefects and class monitors who are tasked with ensuring certain school rules are followed. Some primary schools have "environment rangers" who have environment-focused roles (see Box 2).

Peer support and professional development opportunities

Peer support networks are evident in some schools where teachers seem to have very positive personal relationships with students. In these schools, teachers share ideas and develop joint lessons or work on a project across classes. This was seen only in some primary schools. Teachers

in secondary schools tend to work independently, perhaps due to segregation caused by their subject specialisation (in some schools, there is only one teacher for each subject). Opportunities for professional development occur mainly through the Curriculum Advisory Unit (CAU). CAU focuses on introducing teachers to a variety of teaching approaches as well as providing content-specific training.

Teaching and learning process

Environmental knowledge and familiarity

Teachers exhibited general awareness of environmental issues affecting the Cook Islands. All teachers mentioned litter and illegal dumping of rubbish, the need to recycle, deforestation and/or soil erosion and the need for nature conservation in their discussions. However, teachers are less well-informed about the systems and interactions that may impact on these issues and tend to take a "linear" approach to addressing these problems (e.g. the belief that recycling will solve the litter problem).

Box 1: Strengthening sustainable development practice through policy

Attending a week-long conference on education for sustainable development (ESD) in 2004 prompted one school principal to put some of her good intentions into action. Principal June Hosking and her staff have together placed environmental and sustainability education principles at the heart of the school's vision. Their school policy seeks to develop among students "an awareness of our interconnected world, think critically and take action…"

The policy also advocates an integrated learning approach to increase the relevance and effectiveness of children's learning. Another special feature of the policy is its recognition that children can be very effective agents of change. Having a written policy has encouraged a "whole-school" perspective and initiated the active participation of staff, students and management. Students have become more empowered to raise issues of concern to their teachers and the school board, and are also actively participating in bringing about changes within their school environment.

Teaching environmental issues within subjects tends to be viewed separately from the recycling, composting or other projects that may be carried out on the school grounds. Despite the call of the National Curriculum Framework, many teachers (and principals) continue to view EE as a field of

expertise requiring a science background. School heads automatically recommend science or geography teachers to participate in discussions and/or interviews on the topic of EE. In some schools, English teachers or instructors of other non-science subjects encourage students to discuss environment issues in their lessons (e.g. essay writing in English about littering on the beach, or the need for conservation of specific plants important to traditional practices) but this is more of an exception than the norm.

Teaching methods and approaches

EE is expected to be integrated into existing subject areas, particularly in the high school system, with no separate time allocations in the school curriculum. Environmental issues are taught mainly from a content and/or knowledge perspective through science, social studies, geography and biology courses. Topics include ecosystems, coastal and marine conservation, pollution, fossil fuels, the greenhouse effect, natural disasters and weather.

Primary school teachers favour discovery learning methods, class discussions and group work but this diminishes somewhat in the upper levels where a more textbook-focussed approach tends to be used. Assessment of skills, knowledge, attitudes and values is required under the curriculum guidelines. Teachers employ a variety of techniques in the lower school years (e.g. poster exhibits, story writing, speeches and written questions). EE tends to focus on teaching children good practices such as separating rubbish, using rubbish bins, maintaining a school garden, composting and using kitchen waste for feed, tree planting and preventing coastal erosion. Nutrition and health are also a major focus. One school exhibited a more critical approach to EE by developing student skills in letter writing by writing letters to the editor of the local newspaper (see Box 4).

From Form 1 (Year 7) onwards there is a greater focus on written tests. Students in Forms 5–7 (Years 11–13) are assessed for the New Zealand National Certificate of Educational Achievement. However, several schools also use speeches, essay competitions and other methods for assessment. Speeches have been particularly successful and are held regularly in some schools throughout the school year.

Resources and expertise availability

Textbooks and related material

Currently there is no specific environmental resource book or other material available for use with the prescribed curriculum. However, attempts have been made to introduce teaching resources for an integrated approach to EE in schools.

In 1997, a teachers' guide titled *EE Activities — Social Science* was published by the Ministry of Education for use in Years 5 and 6. This resource contains a large number of activities designed to help teach environmental issues within the social science syllabus in the Cook Islands context, and was based on a teacher training manual produced by SPREP. The book is no longer in circulation and it is unclear how frequently it was used.

In 1999 an "EE Resource Kit" was produced by NES to assist teachers in integrating environmental issues into their teaching programmes. Anecdotal evidence suggests the kit has had limited success mainly because of insufficient prior consultation with the CAU and teachers. According to CAU advisors, the kit is not well aligned with the school curriculum and hence advisors and trainers do not use it in teacher training and professional development programmes. Additionally, insufficient numbers of kits were produced, and normal wear and tear and losses (often through teacher transfers and other factors) have resulted in new teachers being unaware of its existence.

A collaborative project between WWF and CAU is currently developing an integrated, whole-school approach to EE to be piloted in 2007 (see Box 3).

General resources

A number of non-curriculum-specific resources have been produced by NES, WWF and the Natural Heritage Project. Many of these materials are in the Cook Islands Maori language and include fact sheets, posters, reports, videos, slides and photographs. The Natural Heritage Project (formerly part of NES but now a separate entity) specialises in collecting and communicating information on the biological diversity of the Cook Islands. The project has conducted lectures and field trips for schools and the public, produced a variety of posters and books, and have developed a comprehensive database on Cook Islands species that is accessible to the public. A recent development has been the publication of a book compiling the various traditional knowledge and practices of the people of the island of Atiu. The book was a joint project between NES, the people of Atiu and the Natural Heritage Trust.

Despite the apparent proliferation of EE resource materials, only a few are actually used in the classroom or school situation. This is perhaps because the materials are produced for a broader audience and are not necessarily specific to any particular curriculum requirement. Thus, while materials provide teachers with much information, not all teachers are able to effectively use these in their teaching.

Several resources produced by SPREP were found in the NES library, although schools do not have these materials and teachers are not aware of these resources. Many primary schools have posters and other awareness materials produced by NES, WWF Cook Islands, the Ministry of Fisheries and the Natural Heritage Trust.

Access to and use of the Internet and media

All schools have access to the Internet, although in many cases, regular access is only available to the school head. The majority of teachers have their own personal email accounts and there is some use of the Internet for research purposes.

Television, newspaper and radio are well-accepted forms of communication in Rarotonga. NES promotes environmental issues through these media as a matter of course. Many teachers source environmental information from these media and are generally well informed on local issues.

Availability and use of experts

Schools tend to rely on various government departments and NGOs to provide information and expertise on environmental issues. NES, the Natural Heritage Project, WWF, Fisheries Department and Meteorology Department are often requested to speak to students on relevant issues. Teachers consider this interaction to be a major contribution to their lessons and many rely on this expertise to help them work on topics with which they are not familiar. Many of these organisations and agencies also conduct school visits as part of their own ongoing awareness programmes. NES in particular, has conducted a series of teacher workshops and school visits to encourage interest in and understanding of key environment issues in Rarotonga. Funding constraints have reduced these activities in recent years; the NES education programme does not have a regular operational budget and relies instead on project funds. As a result, educational activities often focus on project-specific issues, rather than working on longer-term strategic approaches.

Extra-curricular activities and external relations

Almost every school participates in a variety of non-curriculum programmes that encourage adoption of good environmental practices by students. Teachers consider EE to be about raising awareness on and learning to deal with issues such as waste, pollution, recycling, conservation of plants and animals, and coastal erosion. Two issues that appear to be of particular interest among students and teachers are environmental conservation and litter and waste management. It is generally acknowledged that tourism (the economic mainstay of the country) depends on how well the country manages these issues. Thus, beach cleanups, tree planting, recycling and learning about various marine and terrestrial species are high on the list of EE issues that schools tend to focus on.

An interesting comment was made by a number of teachers that students are "bored with the excessive focus on environment." Others consider that the focus of action-oriented education is on the wrong target group and that the major environmental wrong-doers are not school students but older, out-of-school youth and adults. It is possible that teachers themselves are becoming disillusioned by the apparent lack of tangible changes despite their efforts in EE, but this hypothesis requires further research.

Most schools have strong relationships with the parent community and surrounding residences. All schools have parent and teacher associations that provide direction to the school board on school operations. Parents are also enlisted to help with class trips and other events requiring assistance. The cleanup days and adopt-a-beach initiatives have resulted in mutually beneficial relationships between schools and the community in some areas.

Box 2: It's the little things that matter

The introduction of special "Environment Rangers" at Arorangi School in Rarotonga has resulted in an overall improvement in the management of school litter, according to teachers. Children volunteer to take on the Environmental Ranger positions and are given special caps to denote their status. These children are responsible for ensuring that class rubbish is correctly separated and disposed of in larger bins for collection. Placing the regulatory responsibility on students themselves has resulted in a general acceptance of good waste disposal practices within the school while helping to develop leadership skills in young children.

Summary

Environmental awareness is generally high in the Cook Islands, with both teachers and students exhibiting concern for issues such as beach rubbish and soil erosion. Most schools have at least one programme designed to involve students in carrying out environmentally friendly practices (e.g. rubbish separation, composting, and beach cleanups). However, much of the work is *ad hoc*, often depending on the interest and involvement of the school principal. Furthermore, these programmes, while teaching good behaviour, do not generally require students to think about finding alternative solutions or to contemplate the ultimate value of their actions. Comments by teachers about students being "bored" with EE initiatives would seem to highlight the need for more long-term tangible changes through environmental action.

Box 3: Towards change in schools-based EE

A new schools-based initiative promises exciting possibilities for EE in the Cook Islands. The "Sustainable Schools" programme has been developed by WWF Cook Islands in collaboration with school principals, teachers, curriculum development advisors and NES. The initiative aims to encourage a sustainability ethic among teachers and students through relevant EE within the school context. The draft *Sustainable Schools Manual* states that "EE for sustainability must be future-oriented and look for positive ideas for improvements in how people live their lives…" Students (and teachers) therefore, will not only learn to care for their environment in the immediate term, but also consider how they might be able to avoid other problems in the future. For this to happen, the school will need to look at issues in a systemic or holistic manner and take a "whole school" approach to identifying solutions. Thus, for example, while addressing the "environmental" issue of water conservation, the school may also need to address health, hygiene and financial issues. The developers of the initiative hope that participation in the Sustainable Schools programme will result in overall improvements within the school system. They envisage students who will feel encouraged to think about issues critically and are confident and able to participate effectively in decision-making processes.

The Sustainable Schools initiative is intended to work within the existing school system, rather than as an "add-on" to already full curricula. One of the first steps in the development of the programme was to identify linkages between the existing curriculum and the objectives of EE and sustainability. Sustainable Schools are due to be trialled across the country in interested schools in 2007.

A proposed “sustainable schools” programme to be piloted by WWF Cook Islands will provide opportunities for more long-term and critically reflective approaches to EE.

Current needs of teachers and schools in EE include:

1. Professional development opportunities for teachers and school principals on developing “whole-school” approaches to environmental and sustainability education;
2. Training of teachers in critically reflective educational approaches;
3. Provision of good quality EE resources relevant to the Cook Islands;
4. Networking opportunities between schools (for sharing of experiences, etc); and
5. Better coordination of environmental and sustainability programmes.

There may also be more opportunities to implement “Te Kaveinga Ora no te Aorangi: A Strategy for EE in the Cook Islands.” This strategy may provide a strategic and coordinated approach to EE efforts in the Cook Islands, especially within the school system.

Box 4: From the mouths of babes…Harnessing the power of the media

What started as a routine essay lesson turned into a public advocacy event when students at Te Uki Ou School took to heart their teacher’s directive to write about Rarotonga’s environment. Their essays were so passionate that their teacher decided to have them published in the local newspaper. With the help of the school principal and their English teacher, the self-made environmental activists turned their essays into “Letters to the Editor.” This in itself, turned out to be a huge learning exercise as the 5th and 6th graders battled with the concept of saying more with less. Once satisfied with their efforts, the school submitted the letters to their daily newspaper and the children were rewarded with an entire page dedicated to their letters. Even more impressive was the content of the letters. Far from merely complaining about the state of their environment, the children’s letters provided well-considered suggested solutions combined with a sprinkling of emotion and idealism that is often only evident in the young. More action of this nature could really bring about motivation for change; after all, who among us can resist the calls of the young?

Environmental education in Fiji's schools (Suva/Nasinu area)

Background

EE in Fiji has been identified as a priority in environmental strategies and related documents. The Ministry of Environment has overall responsibility for EE and awareness-raising within the community and schools. In the past, the Ministry has organised a number of schools-based events but these have been mostly "one-off" programmes (such as poster competitions or other activities) attached to the observation of national environment week and other environmental awareness days. The Ministry has, to date, only had one officer dedicated to EE, communication and public awareness, sometimes supported by a volunteer. The EE officer's role has also included managing the Ministry's information and resource centre. This lack of human resources has resulted in a diminishing role of the Ministry in both community and schools-based education. The bulk of schools-based EE throughout Fiji is largely funded and driven by non-governmental groups. There is often inadequate coordination or synergy of these programmes, either between themselves or with the activities and priorities of the Ministries of Education and Environment. Many of the programmes are too short-term to have significant impact in the education system. The duplication and waste of resources is significant.

The NGO Live and Learn EE has a long-standing memorandum of understanding with the Department of Education, which enables it to carry out a variety of longer-term environment-related education programmes through schools. Live and Learn, through the Ministry of Education, is attempting to provide a means of coordinating other schools-based EE in Fiji. Other organisations, such as the Human Rights Commission and various United Nations programmes, also make schools visits on human rights, health and peace issues and civics and life skills curricula are currently in development by the United Nations Development Programme (UNDP) and the United Nations International Children's Fund (UNICEF), respectively.

In Fiji, children begin attending school at ages four or five (Early Childhood Education), and continue through primary school (Classes 1–8) and on to high school (Forms 3–7). Selection examinations occur at Class 8 and at Forms 4, 6 and 7 (university entrance). Education is said to be compulsory and free until age 15, however the Class 8 selection exam and school costs of uniforms, textbooks, stationery, transport and administration fees tends to make education unavailable to many.

Classes are taught in English although teachers may teach in either Fijian or Hindustani in the early years, depending on the demographics of the school. All textbooks, other than language texts, are in English.

National curriculum and policy

The mission statement of Fiji's strategic education plan, *Educating the Child Holistically for a Peaceful and Prosperous Fiji: Strategic Plan 2006–2008*, recognises the need for a "relevant and responsive education system that allows all students to reach their full potential." The plan aims at developing students who respect others, appreciate Fiji's multicultural heritage, and are responsible, informed and involved global citizens. Character development and leadership training, including values, environment and enterprise education are also highlighted as essential life skills to be provided through the formal education system. These objectives are being pursued by the CDU through the development of a National Curriculum Framework under the Australian Government and funded by the Fiji Education Sector Programme.

The National Curriculum Framework provides an opportunity for many of these issues to be integrated across the curriculum rather than simply being inserted as content matter.

The current national curriculum and associated subject syllabi (particularly in sciences, social sciences and geography) incorporate environmental content matter at different year levels. These include marine science (mangroves, fisheries, turtles, and coral reefs), climate change, waste (including chemical waste), impacts of construction on waterways, deforestation, and Fiji's flora and fauna.

School culture and organisation

EE policy

Schools do not have specific EE policies; however several schools have general policies relating to the quality of the school grounds and waste management. Some schools are also very specific regarding the need to apply a "whole-child" approach to education and values, character, leadership and similar issues are integral to the education programme. Those schools with clear policies on such issues appear to have more success at developing whole-school education programmes and involving all students and staff, perhaps because it enables these philosophies to become part of the school system (see Box 5).

Decision-making processes

All schools have regular staff meetings although their frequency varies. For some schools, this is the only opportunity for teachers to participate in the running of the school. In other schools, teachers have formed environmental committees as a means of advising the administration of potential improvements in the school. The active participation of teachers on these environmental committees has led to improved school appearance as well as more positive participation.

Box 5: Educating for life — a school philosophy for everyone

The smiling faces of the students and teachers say it all at SSM Primary School in Nabua, a small suburb just out of Suva City in Fiji. The positive atmosphere that pervades the entire school is testimony to an actively involved school management board, an enthusiastic and supportive school principal and a team of dedicated teachers. The school, which has 20 teachers and 700 children from kindergarten to Class 8, is founded on a "whole-child" education philosophy that encourages non-academic activity within the school programme. Students at SSM have the opportunity to participate in gardening programmes, a variety of clubs (including an environmental club) and a selection of sports. Fijian language and cultural lessons are also part of the school programme.

The school has a number of environment-related activities, many of which are linked to food and nutrition and other programmes. For example, the school sports an organic vegetable garden tended by the students with the help of some adults. The garden products are sold by students to the school canteen, which cooks food on the premises for sale to children and teachers. Fruit days and "no-litter" days are organised to remind children of good practices relating to health and the environment. Different teachers volunteer to take responsibility for these and many other activities.

School principal, Mrs Urmila Achya, believes that the school is able to continue these programmes primarily because of a supportive school management and a school philosophy that goes well beyond providing an academic education. Character formation, leadership skills and positive life values are developed primarily through these "out-of-classroom" activities.

A few schools have a student council that ensures student needs are heard by the administration and management. However this does not appear to be a common practice.

Peer support and professional development opportunities

Larger secondary schools have heads of departments who have responsibility for ensuring that junior or new teachers have the necessary support. However, this is not generally the case in smaller schools where there may be only one teacher per subject across all year levels. In primary schools teachers are allocated a year level for which they are responsible and therefore may not always interact with teachers from other classes.

Opportunities for in-service professional development occur mainly through the Department of Education. Many teachers also take extension or distance education classes with the University of the South Pacific (USP).

Teaching and learning process

Environment knowledge and familiarity

Teachers' generally exhibit some awareness of environmental issues in Fiji and beyond. Issues such as waste management (recycling), nature conservation, water conservation, deforestation, climate change and biodiversity were mentioned in discussions with both primary and secondary teachers. However, many secondary school teachers stressed that their knowledge about these issues is limited to what they are required to teach through the existing curriculum. The concept of sustainable development is familiar to teachers of social studies and geography. The idea of the environment as being one of the three pillars of sustainable development does not appear to factor as a major issue in considering solutions to perceived environmental problems — these problems are generally addressed through short-term approaches (e.g. separating waste and planting trees).

EE is viewed as a science or social science-focused subject, but it is notable that environment committees, where they exist, are made up of teachers from a range of subject areas.

Teaching methods and approaches

Teachers appreciate the need for student-centred learning methodologies in both primary and secondary school. Most secondary school teachers, however, are not confident that they can apply these approaches and still complete their exam prescriptions. Teachers interviewed at a recent EE workshop stated that while they like and enjoy the many activities, they simply cannot find class time to incorporate these into their teaching. Many teachers have not received teacher training and have entered the teaching system after gaining an undergraduate degree, which may limit their knowledge of learning mechanisms and appropriate pedagogical approaches. At the same time, the

pressure on teachers to ensure “good pass rates” for the final examinations is often very strong and the key factor in evaluating their own success as teachers. In fact, it was found that for selection exam years, teaching is often focused so rigidly on the exam prescription that teachers may resort to teaching based on past years’ exam papers. While this is not a common occurrence, it does highlight the pressure of exams. An internal assessment system is currently being trialled as a means of moving away from exam-focused teaching, which may enable teachers to better accommodate new pedagogical approaches.

Students in various year levels are encouraged to participate in debates and oratory contests mainly through English classes, and teachers consider this an important activity to encourage critical thinking and reflection.

Primary school teachers are more student-centred, using approaches such as group work, discovery learning, role playing, research and discussion to maintain children’s interest and ensure effective learning. However, this tends to vary according to the teacher’s interest, motivation and training and it is common to see children in classrooms repeating sentences as a group or sitting quietly copying material from a blackboard.

Resource and expertise availability

Textbooks and related material

Textbooks for several secondary subjects are outdated. Some subjects in the higher forms do not have specific textbooks supplied by the Ministry of Education, and teachers must rely on what they can obtain themselves. The better-resourced schools tend to have a selection of textbooks and reference materials for teachers and students.

Primary schools obtain their textbooks from the Education Resource Centre of the CDU and can make requests for new sets as required.

The Fiji Education Sector Programme aims to rectify the textbook and resource material issue and it is expected that once the National Curriculum Framework is in place, the CDU will be in a better position to begin developing appropriate and relevant textbooks for all year levels.

General resources

No SPREP, UNESCO or other regional material was found in schools. Some teachers suggested that this may be because material is received through the principal's office and that internal systems prevent the materials from reaching the right teacher. Others believed that sometimes a set of materials might be delivered to one teacher who may fail to share it with colleagues or take it for personal use.

The Ministry of Environment has a resource centre that can be used by teachers, although currently there is no system to make teachers aware of this availability. The national library is well used by students in the Suva area.

Access to and use of the Internet and media

The Internet is used for research purposes by many younger secondary school teachers, who rely on it especially where textbooks and other resources are unavailable. Several schools have Internet access available in the main office but, depending on the school culture, it is usually only used by the principal.

Most teachers read at least one of the daily newspapers and said that they use current affairs as a source of discussion in the classroom where relevant.

The local television company provides a number of interesting and locally relevant programmes that could potentially be used as teaching resources. While teachers are aware of the programmes, it is not clear that they make use of this opportunity.

The radio continues to be accessed by everyone at different times of the day and teachers noted that they obtain a lot of current affairs information from radio talk shows.

Availability and use of experts

There is a range of organisations offering expertise in environmental and related issues. These include the Ministry of Environment, Ministry of Fisheries, the Meteorological Service and a range of NGOs (including WWF, Birdlife International and World Conservation Society). Regional and international organisations such as the Secretariat of the Pacific Community (SPC), the Pacific Applied Geoscience Commission (SOPAC), USP, World Health Organization, UNDP and UNICEF also often have outreach programmes that can be accessed by schools on request.

Few teachers claim to have made much use of these opportunities, although some have requested materials to be sent to them for specific issues. It appears that in most cases, teachers simply are not comfortable contacting such organisations. Requests for information on subject-specific issues are sent to the CDU, which makes available any material at their disposal. There is currently no system to make teachers aware of the potential of other organisations to assist.

Extra-curricular activities and external relations

Non-examinable subjects such as gardening, moral studies and physical education are mandated by the Ministry of Education in Fiji. These extra-curricular subjects are treated differently by different schools. Since they are not examinable, some schools choose not to teach them at all and use the time allocated for these subjects for other academic studies. Other schools take these subjects very seriously and devote substantial time and energy to ensuring that students are well catered for in these areas (see Box 76).

In addition to mandated subjects, schools also participate in programmes organised by other agencies. Live and Learn EE, in particular, offers several programmes in which schools may participate. These include programmes such as Helping Our Planet Earth (HOPE) and Rivercare, which seek to encourage students to think critically about their surroundings and participate in a change process. These programmes rely, to a large extent, on the involvement of Live and Learn staff and on the motivation and interest of teachers. The programmes are not curriculum-based although they do provide opportunity to integrate activities and ideas into existing curriculum for various subjects.

Many schools also participate actively in poster competitions, cleanup programmes, national environment weeks, oratory contests and debates.

Summary

EE in Fiji tends to differ greatly between schools. Some schools exhibit great interest in and commitment to environmental issues and children work with teachers to beautify their schools environs and set in place conservation measures for energy and water. In many cases, these activities have been initiated as a result of education programmes run by NGOs such as Live and Learn Environmental Education.

Fiji's exam-oriented education system limits the willingness of many teachers to participate in EE in a meaningful way. Teachers tend to focus on completing the prescribed syllabus in time for exams and, as a result, choose didactic, teacher-centred teaching methods. Students learn concepts largely by rote. Critical thinking is considered important but teachers feel that school debates, oratory contests and other extra-curricular programmes provide these opportunities.

The Ministry of Environment is understaffed and has not, in recent years, had significant input to schools-based environmental education.

Box 6: Gardening — hidden potential?

Fiji's Ministry of Education mandates gardening as a non-examinable primary school subject. Gardening provides schools with an opportunity to involve students in outdoor work, and to take responsibility for growing and eventually harvesting their first vegetable crop. Some schools have chosen to go a step further and use gardening to teach a variety of issues, such as the value of natural fertilisers and composting, healthy eating, and use of plants for medicinal purposes. Others have introduced basic enterprise education, encouraging children to sell their surplus cabbages and herbs for a few dollars.

Not all schools are so enthusiastic, however. Several schools have stopped gardening altogether, citing the new Occupational Health and Safety Guidelines as their reason. Others feel that the wet Suva weather is not conducive to gardening so students are kept indoors, often to spend more time on an academic interest subject. Some schools only do gardening in the final term once exams are over.

Gardening offers the possibility of teaching children to question and think critically about the world around them and to participate actively in solving problems. Studies from other countries have shown that, if encouraged to, the youngest of children will show innovation in problem solving. Gardening offers just that opportunity in a non-threatening situation.

Box 7: Helping Our Planet Earth – HOPE: A success story

HOPE is an initiative of Live and Learn EE, which aims to build the capacity of students to participate in learning activities throughout the school. HOPE promotes dialogue and participation in the classroom and encourages active learning, discussion and respect among students for each other as valuable sources of knowledge and experience.

HOPE promotes a "whole-school" approach to learning, which initially focuses on beautifying the school environment. HOPE school projects have included setting up herbal gardens, fish ponds, water tanks, water collection areas for flower gardens, energy conservation measures and waste management programmes. More significantly, HOPE has resulted in students who feel more empowered to participate in decision-making and who are able to think critically and creatively and work with each other (and their teachers) as a team.

Although a significant part of HOPE occurs outside the classroom, the programme also encourages teachers to consider integrating environmental ideas into their lessons and to make the environment an all-encompassing part of the school programme.

Over 100 schools throughout Fiji currently participate in HOPE.

Environmental education in Kiribati's schools (South Tarawa)

Background

There is a significant focus on community-based EE in South Tarawa. The Environment and Conservation Division (ECD) of the Ministry of Environment, Lands and Agricultural Development has chief responsibility for community-focused EE and awareness although other organisations — such as Teitibwerere Community Theatre, Foundation for the Peoples of the South Pacific Kiribati (FSPK), the United States Peace Corps, and even the Government of Taiwan — also play a significant role in this area. The ECD runs a series of community education and awareness activities, including a radio talkback show, school visits and organised competitions. In early 2007, a campaign was launched to highlight the need to reduce the use of non-biodegradable plastic bags and introduce biodegradable alternatives. The launch of the bags was accompanied by school performances, speeches and other entertainment for all ages of the community. The introduction of legislation requiring a container deposit fee in 2004 for all plastic and aluminium containers in the country was hailed regionally as an important step in Kiribati's approach to waste management.

The FSPK has also initiated several highly successful programmes such as the banana circles initiative (encouraging household management of organic waste), healthy eating programmes and South Tarawa's waste recycling initiative, Kaoke Mange! FSPK works closely with youth and women's groups as well as government. The Government of Taiwan and Kiribati's Ministry of Agriculture have introduced a number of agricultural programmes to encourage the planting of healthy foods such as cabbages, tomatoes, beans and fruits. These initiatives have contributed to increased community participation in addressing important environmental issues.

All school-based education falls under the jurisdiction of the Ministry of Education's Curriculum Development Resource Centre (CDRC), which determines how new programmes are introduced into the curriculum. The CDRC is also responsible for providing appropriate resources, textbooks and professional development opportunities for teachers. The ECD has conducted a number of activities in the past to encourage incorporation of EE into the school curriculum. These have included teachers' workshops, school visits, development and distribution of posters and information sheets, and an ongoing radio programme. Unfortunately, the lack of financial resources for EE and subsequent dependence on project funds has meant the education and media unit tends to focus on project priorities rather than on an ongoing and dedicated education programme.

Current education development policy for Kiribati has a strong focus on improving access to basic education by upgrading teacher qualifications and their capacity to teach to an improved curriculum. Education policy is also geared towards meeting national strategic goals of providing the necessary workforce skills to support private sector development and enabling increased capital investment (GOK 1996. The education sector in Kiribati is coming to the end of phase two of the Education Sector Reform Programme funded by the Australian Agency for International Development (AusAID). It is envisaged that the next stage of this reform process will include a full review of the school curriculum, however it is not clear at this point how the proposed curriculum review will affect recent achievements and improvements in the education system (especially with regards to the development of resource materials under the current curriculum).

National curriculum and policy

The vision of the Ministry of Education, Youth and Sport (MEYS) is to:

> provide access to lifelong education that maintains pride in Kiribati cultural identity, community and traditional values and prepares I-Kiribati citizens to participate effectively in life and work in small nations, the Pacific Region and globally. (MEYS 2004).

The MEYS states four key goals in its 2005–2006 operational plan:

1. Increased access to education for all children and youth
2. Increased access to lifelong training and education activities
3. Improved language and literacy skills
4. Strengthened partnerships among all education providers.

A long-term goal of the MEYS is to equip school leavers with skills that will prepare them for both formal and non-formal employment. Maintenance of traditional skills, values and community relations is also stated as a priority long-term focus.

Environment curriculum in primary schools (Grades 1–6)

MEYS requires that the following subjects also be taught in primary school:

- Mathematics
- English
- Kiribati
- Physical Education

- Environmental Science

Religious Studies, Arts and Crafts, and Music are also taught but are not compulsory. “Handwriting” is not mentioned in the list of required subjects, although it appears to be a separate subject to which significant time is devoted, even in the upper primary school years. School periods are divided into half-hour sessions, with approximately half an hour to an hour per week set aside for Environmental Science. Teachers are expected to teach in English after Class 3, although many discussions with teachers have highlighted that this is not the case because teachers are more comfortable teaching in the Kiribati language.

An Environmental Science syllabus was developed for primary schools in 2004 (Classes 1 to 6) under the AusAID Education Reform Project. The syllabus is essentially an integrated basic science and social studies programme and includes topics such as:

- The place of Kiribati in the world
- Biodiversity and landscapes
- Health issues (nutrition, medicine, animal care)
- Environmental protection
- Collecting rainwater
- Weather (including global warming and climate change)
- Pollution

Importantly, the syllabus states that the main concepts of the curriculum are respect for self, each other and animals; care for family, the community and all living creatures, including the reef and ocean; and maintenance of infrastructure and machines. The syllabus further states that it aims to prepare students for secondary schooling and higher education and also for traditional subsistence living.

A series of resource materials, including a set of posters has also been developed to aid the teaching of lessons outlined in the teachers’ guides. Enough materials were produced for every primary school teacher to receive one set.

The Environmental Science syllabus recommends three lessons of at least 30 minutes each per week for completion of the programme. The syllabus (and associated teachers’ guides and resources) does not prescribe formal teaching methods but rather encourages the use of a variety

of learning approaches, particularly discovery learning. Some examples include field trips, outdoor activities around the classroom and use of materials from within the environment.

Assessment is currently undertaken every second year of the child's schooling (Classes 2 and 4 in the first year, Classes 3 and 5 in the subsequent year). An examination of the 2006 test papers (Classes 3 and 5) raises some questions as to the appropriateness of tests in assessing whether children are learning skills and knowledge relevant to the environment. Questions appear to focus on children learning facts by rote. Many of the questions require students to define a term or to name well-known organisations in the country. Very few of the questions require independent thought or analysis. This suggests two possibilities 1) that those responsible for preparing the assessment tests may not have the same view of EE as those who wrote the syllabus statements and resources; and/or 2) assessors are not aware of appropriate mechanisms through which to effectively assess student learning. Further study is required to corroborate these assertions.

Environment curriculum in secondary schools

Secondary school years are Form 1–6. There is no separate environmental curriculum from Form 1 onwards. The school schedule is divided across nine subjects: Mathematics, English, Kiribati, Industrial Arts (males), Home Economics (females), Accounting, Science, Social Science, Physical Education and Religious Studies (one hour per week). Environmental issues are integrated into subject areas such as Science, Social Science, Kiribati Studies and Geography (Form 4 onwards). In general, environmental issues cover understanding of specific topics including ecosystems (focus on mangroves and coral reefs), biodiversity, global warming, pollution, water, waste (including chemical waste) and coastal erosion.

Although there is no specific mention of EE in education policy statements, the government of Kiribati has shown interest in this area. In 1996 a series of Environmental Science resource books were developed for Classes 6 and 7 through a collaborative arrangement between the Ministry of Education, SPREP and the USP's Institute of Education. The environmental science materials broadly addressed science and social science topics. However, an evaluation of the programme in 1999 revealed that the materials were not being used in most classrooms and that few teachers even had full sets of the books. The evaluation further found that as environmental science was not a compulsory or assessable subject in the school curriculum, most teachers were not motivated to teach it (SPREP 1999b).

School culture and organisation

Environmental education policy

Within the schools visited as part of this report, no school had a written policy on EE nor had they demonstrated any environment-related programme within the school. However, discussions with head teachers suggest that in general, they consider environmental education to be important for the future of Tarawa and are supportive of student participation in extra-curricular environment-related activities (such as cleanup programmes, environmental awareness days and poster competitions) as long as this does not impose on normal study time. In all discussions, teachers stressed the importance of "telling the children about the environment." They explained that children needed to know about issues such as waste, recycling and conservation. Teachers considered these issues to be important to the health and future well-being of the nation, although most were unable to identify and discuss any specific local issues that concerned them personally. Two teachers raised concern about climate change and its impacts on Kiribati, explaining that this had come to their attention through a recent poster competition on the subject.

Decision-making processes

It was not possible to ascertain exact methods of decision-making. Principals are shown respect by teachers and have the final say in decisions although all schools have regular staff meetings, which potentially allow teachers to give input to the running of the school. Opportunities for reflection and personal critique seem limited. Teachers have full schedules, and recognise that the lack of "down-time" does affect the quality of their work. Several teachers expressed their appreciation at being able to participate in the interviews and discussions for this study, explaining that they seldom had a chance to really think about what they were doing from different perspectives or that the questions had provided ideas about activities they could do themselves.

All schools have a system of prefects and class monitors who are responsible for a range of activities, including the behaviour of their peers. Selection of such students is often based on their academic excellence.

Peer support and professional development opportunities

Most schools do not have strong peer support networks, either formal or informal. Heads of departments agreed they should provide more opportunities for teachers to discuss issues and topics with which they may be having problems, but they also noted that this was often considered

to be culturally inappropriate. Teachers therefore mainly tend to work independently of their colleagues.

Professional development is offered through the CDRC mainly during school holidays. This allows teachers from outer islands to participate. Other workshops and seminars are held throughout the year but these are usually to provide familiarisation with new resource material or as part of overseas-funded capacity building projects. ECD has also coordinated workshops on environmental issues.

Teaching and learning process

Environment knowledge and familiarity

Discussions with both primary and high school teachers suggest that teachers would benefit from building on their knowledge of environmental issues that they are required to teach. Discussions on topics such as climate change and biodiversity conservation suggest the need to support training that would explore the causes, effects and synergies between such issues. Similarly, while there was general acceptance that the environment, the country's economy and people's welfare are all linked, teachers said they do not generally focus on these links when teaching about environmental issues. Those with little science background are less confident in teaching about these issues. One school principal noted the need for specific schools-based activities that would help improve school health and environment. He referred to issues such as the need for safe drinking water, better sanitation facilities (disposal and use of wastewater) and paper wastage. It was his opinion that implementing in-school programmes to address such issues would increase student involvement in learning about the environment. However, he suggested that neither he nor his staff had the necessary technical background to be able to initiate such ideas.

Teaching methods and approaches

In primary schools the content and knowledge focus is also reflected in assessment documents (test papers) for environmental science. Many of the questions appear to test students' ability to memorise definitions and names of places, rather than their knowledge or understanding of specific issues (2006 Environmental Science Assessment Classes 3 and 5).

Within the secondary schools, there is no separate time set aside for EE. Environmental and conservation issues are taught through the science and social science subjects, which mainly focus on teaching facts and concepts. With only very few exceptions (such as prescribed field trips), most teachers tend to favour the "chalk and talk" method, particularly for those issues they may not be

totally comfortable teaching. Hence, students rarely make the connection between what they are learning and what is happening in the world around them. For example, students learn from the teacher *about* recycling aluminium cans and plastic, the importance of fisheries resource management and conservation, the "mechanics" of global warming and climate change, and health issues surrounding improper sanitation and waste disposal. However, classroom discussions are limited with little demonstrated links between classroom teaching and out-of-class activities, even if just around the schoolyard.

Field trips are required as part of science and social science and geography lessons at junior secondary and secondary level. Teachers explained that transport for field trips is expensive so several visits tend to be combined into one trip (e.g. visits to the rubbish dump site and the meteorology office). Teachers often follow recommendations for field trips set out in the syllabus and do not attempt to identify less expensive out-of-classroom opportunities for learning. It was not clear how teachers used field trip opportunities to encourage student-centred learning.

Many teachers also teach good environmental and conservation practices informally through subjects such as Kiribati and Social Studies. For example, as students learn skills such as fishing, house building and weaving, they also learn the best methods for extracting resources without damaging the plant or the fish population in the long term. Teachers however, did not automatically consider this to be EE, perhaps because no specific "environment" terminology was being used.

Drama is a favourite awareness-raising tool used in Kiribati. Various groups are contracted by ECD, FSPI and others to use drama and comedy to involve community groups in discussing social and environmental issues affecting them.

Resource and expertise availability

Textbooks and related material

The CDRC has developed Teachers' Guides for Environmental Science for each of the primary school class levels. The guides provide teachers with week-by-week lesson plans for each topic. The aim of these guides, published in 2004, is to provide a means by which teachers have sufficient information to teach to the Environmental Science syllabus. The guides take into account the busy lives of teachers and provide helpful advice on planning for the next week, preparing materials in advance and other topics.

Not all teachers were aware of the teachers' guides. Informal interviews with teachers, teacher trainers and CDRC staff suggest that the reason for this may be the manner in which schools manage their textbook stocks. When schools are issued with new books, these tend to remain with the teacher who is there at the time, rather than becoming the property of the school. Thus, if the teacher is transferred to another school, he or she may take the books with them, leaving the new teacher unaware of the resource. The CDRC does not have a policy (or the resources) to provide new sets of books each year and often there is only a single print run of the books, produced as part of an overseas funded project. There also does not appear to be a readily available resource list or other inventory of CDRC produced material.

An important issue raised during discussions with teachers and teacher trainers was that of language. While teachers are expected to teach in English after Class 3, this is generally not the case as teachers are more comfortable teaching in the Kiribati language. English is the official language of Kiribati, although it is seldom used in everyday conversation. Many teachers appear to lack the skills (or are reluctant) to speak English. The lack of appropriate EE teaching resources in the vernacular means that teachers must first read and understand information in English, and then convey this information to students in their own language.

General resources

Few books or other resources are available through the MEYS for teaching environmental issues at junior and senior secondary levels. Teachers rely on information provided in their textbooks, many of which are outdated and insubstantial. Few schools have well-established libraries and it is possible that newly received materials are not stored for long-term use. No SPREP, UNESCO or other regional material was found in schools other than a set of USP-produced fisheries conservation manuals in one primary school.

A discussion with the CDRC revealed that a set of materials had been received from SPREP and that these materials were being used by CDRC to inform the development of new social science curricula. However, it was also acknowledged that additional information would be needed to be able to fully develop their curriculum and provide adequate resources for teachers.

The National Library and the USP Centre Library provide access to books and reports on the environment, but only a small number of teachers said they made use of these; they suggested that it was mainly due to that fact it was too time consuming and not always easy to get to the libraries.

Access to and use of the Internet and media

A very small number of teachers interviewed had regular access to the Internet. Primary school teachers did not have access to the Internet in school nor did they use it outside school hours. Most junior secondary schools did have Internet access although this was generally restricted to school principals, heads of departments and computer science students or teachers. Those teachers who do have access tend to use it primarily for emailing or to conduct searches on specific topics when necessary. In the schools surveyed, it appeared that no staff member used the access to the Internet as a primary source of information on news and current affairs or to subscribe to any science or conservation and environment site. The few teachers who use the Internet tended to be studying a distance education programme with USP and, therefore, had access through the USP Centre. The main reason given for lack of Internet use was cost and access.

There are several newspapers in Kiribati and most teachers said they read the newspaper when they have time. However they did not appear to consider this form of media to be a resource for their teaching. The newspaper is read in teachers' leisure time and therefore not always linked to the classroom or lessons.

Television is relatively new in Tarawa and does not yet seem to be a major source of information – most teachers interviewed said they prefer to watch DVDs rather than TV programmes. However, a local video company, Nei Tabera Ni Kai, produces a number of social and environmental interest videos that are broadcast on the local television channel.

The radio is a common medium to which everyone has access and is heard in most homes during the day. However, teachers said they sometimes listen to the radio outside of school hours but more often prefer music CDs. The CDRC runs a schools broadcast programme aimed at enhancing learning within the curriculum and the ECD also runs a 15-minute regular environmental talk show on the radio.

Availability and use of experts

Most of the expertise in environmental matters tends to be housed at the various government ministries and departments and with NGOs. While most organisations may not have a regular educational programme, they are generally willing to visit schools on request as guest speakers, assist with class field trips, or provide teachers with information on specific issues. Some schools

make use of these opportunities but it appears that many teachers have not fully realised the potential of these resources or are not aware that they can access them.

Extra-curricular activities and external relations

Schools, teachers and students actively participate in environment-focused activities outside the curriculum requirements. These include Environment Day observations, ECD-driven cleanup days, tree planting, issue campaigns (such as the Pacific Year of the Sea Turtle and the green bag campaigns) and various schools competitions. In 2006, a SPREP-initiated schools competition was organised as part of observations for the Pacific Year of Action Against Waste. Several schools received start-up funds and participated actively in this competition, which was judged over the year by ECD staff. A youth group, comprising school students and other youth, is also highly active in South Tarawa. The group carries out a variety of environment-related activities aimed at raising community awareness and also generally keeping the environs clean. Much of its work is carried out with limited funding and mainly with the support of the ECD.

Summary

EE in Kiribati schools is limited despite the existence of a primary school Environmental Science syllabus. EE is largely interpreted as education *about* the environment and is considered to be a branch of science. Teachers focus on teaching content mainly using a didactic approach involving blackboard notes and textbooks. The non-mandatory status of EE also means that many teachers do not give it high priority in their teaching programmes.

Several factors impeding the development of critically reflective EE in Kiribati schools were identified:

1. Lack of current information and resources on environmental issues in the local language,
2. Lack of teacher understanding about EE, and
3. Reliance on didactic teaching approaches that do not encourage reflective or innovative thinking.

It was observed that the programmes most successful in engaging student participation are those that are driven from outside the school and involve some form of action. The ECD plays an important role in this area, with its focus on community education and action. ECD has organised and implemented a variety of programmes focusing on waste reduction and biodiversity conservation that have involved schools and communities in some way. Currently however, budgetary issues limit the ECD's role in schools-based education.

Environmental education in Samoan Schools (Apia)

Background

Samoa's Ministry of Natural Resources and Environment (MNRE), has the primary responsibility for sustainable development and management of Samoa's natural resources and environment, and plays an important role in promoting awareness of environmental issues. The MNRE has a Capacity Building Section, with a team of seven staff dedicated to EE, awareness and training. The Capacity Building Section works closely with other MNRE divisions to coordinate awareness and educational programmes with schools and youth groups in communities. MNRE produces a wide range of education and information materials, runs school presentations on environmental issues, assists with school field trips and promotes different environmental issues through school competitions and national awareness days. An environmental column is also run weekly in Samoa's key newspaper to help foster environmental understanding and participation of young people.

Other agencies such as the Meteorology Department (now part of the MNRE), Ministry of Fisheries and the Samoa Water Corporation also carry out school visits and provide resource materials for students and teachers. NGOs such as the O Le Siosiomaga Society and the Samoa Marine Environment Trust have also produced and distributed education and awareness material on the environment, some of which are school-focused materials. The United States Peace Corps programme has also had significant input in the past. In 1997, a Peace Corps Volunteer worked with the Curriculum Development Centre to integrate EE into the formal education system. An EE curriculum statement was drafted for Years 1-12 but has not been endorsed.

Schooling in Samoa begins at the age of five years when the child enters Year 1 of primary school.[5] Primary schooling covers an eight-year cycle concluding with a national selection examination (the Secondary Schools Entrance Exam) in Year 8. Education is undertaken in the Samoan language from Years 1–6 and then in English from Year 7. Secondary school runs from Years 9–13 with selection examinations in Years 11, 12 and 13.

Schools in Samoa are owned and funded either by the government and church groups, or are privately run. The Ministry of Education, Sports and Culture has developed formal partnerships with local communities including villages and districts. Villages and district communities provide the

[5] Early Childhood Education is now also being promoted by the Ministry of Education, Sports and Culture but is not currently a requirement to enter primary school.

school buildings and furniture and are responsible for the maintenance of the school and its equipment. The Ministry of Education, Sports and Culture appoints the principal and teachers, pays their salaries, and provides stationery and curriculum materials to the school. The principal is responsible for the operation and management of the curriculum programmes conducted in the school.

Strong links with the community place schools in a good position to develop teaching and learning programmes relevant to student needs and to involve the community in implementing these programmes. However, the level of participation is often dependent on the interest and motivation of the school principal and on the community itself.

National curriculum and policy

Samoa's draft National Curriculum Policy Framework highlights the importance of education in teaching young people the "virtue of reason" and in maintaining and developing the cultural fabric of society. According to the document, Samoa's curriculum policies have been developed to:

> ensure that all young people are well prepared academically, socially and culturally and have the knowledge and wide range of skills needed to ensure that they all can contribute positively to the local and broader world community in which they live.
> (MESC 2006)

The framework emphasises the need to develop [in students] "environmentally and socially sustainable practices," noting that this applies not only to the physical environment but also in the way society structures itself socially, culturally and economically. It also encourages the use of teaching approaches that "encourage enquiry, problem solving, debate and independent thought" and for appropriate training for teachers to apply such approaches.

The Samoan curriculum includes on Samoan, English, social science, mathematics, science, health and physical education, and the performing and visual arts. Environmental and sustainable development issues are covered mainly in science and social studies (and agricultural science, biology, chemistry and geography in the higher forms).

The science curriculum specifies that it will help students to develop “attitudes of responsibility towards the environment and natural resources, an awareness of the impact of science on society, and to explore courses of action regarding science related issues in society.” In Years 7 and 8 science, students learn about environment-related issues such as the food web and pollution. They also learn communication skills such as using the media and organising a village meeting. Critical analysis of the media and advertising is also carried out under the topic on smoking. The achievement objectives for science in Years 9–12 do not specifically address the development of responsible attitudes through science but teachers are encouraged to apply learning approaches that will help students think more deeply about issues. The Year 12 and 13 biology achievement objectives require students to investigate a local environmental issue in some detail. The strand on genetics also offers an opportunity to discuss the importance of biodiversity to the long-term survival of communities and populations.

The social studies curriculum (Years 9–11) focuses on developing in students an understanding of the “place of individuals in society, their rights, responsibilities and privileges.”Exploration of values and belief systems and critical reflection is also encouraged through achievement objectives that require research and discussion on a variety of issues.

Other subject areas such as health and physical education and performing and visual arts also provide opportunities for developing communication skills and establishing all-important positive values and attitudes such as respect for self and others.

The framework prescribes time allocations for each subject at different year levels with the expectation that these allocations will allow for good teaching practices to be employed in the classroom.

School culture and organisation

EE policy

There are no specific school policies on EE although the environment is considered important by school principals and teachers, especially from an aesthetic perspective. Some schools have recently commenced a plastic recycling programme (see Box 8) with a private company, although it is currently unclear how much education actually occurs through the programme. One private school encourages students to bring reusable lunch boxes and drink bottles to school, and to separate food waste for composting as part of its efforts to reduce rubbish.

Generally, however, there are few programmes in schools that actively encourage student-initiated changes. Clean school grounds and rubbish separation are part of the school rules and students are expected to abide by them. Many teachers expressed a belief that student behaviour depends on whether there is a chance of getting caught (e.g. being seen by an elder) rather than on their personal awareness of or concern for the environment.

Decision-making processes

Processes of decision-making appear to differ between the independently run schools and the government schools. All schools have regular staff meetings. Teachers in independently run schools consider that they have adequate input to decision-making, while teachers in government schools tend to be at ease with decisions coming directly from the principal and do not feel the need to question the process. Teachers do not have a great deal of time for reflection and discussion on their teaching methodologies or other school processes.

All schools have a system of prefects and class monitors responsible for a variety of tasks.

Peer support and professional development opportunities

In some schools, particularly mission and private schools, teachers appear to have formed their own informal support groups and tend to be comfortable talking about their lessons and sharing anecdotes from various classes. It was not possible to learn whether there were similar interactions in government schools.

Opportunities exist for professional development provided through the Ministry of Education, Sports and Culture workshops, and other training programmes are held throughout the year, but principals decide who will attend. Teachers also have opportunity to attend independently run courses at the two universities at their own cost.

Teaching and learning process

Environmental knowledge and familiarity

Teachers generally have some awareness of environmental issues in Samoa. Rubbish (i.e. waste management), climate change, biodiversity conservation and overfishing are considered the most important environmental issues by almost all teachers, although some also mention logging, water

conservation and agricultural impacts. All teachers express interest in and a desire to teach environmental issues in the school but raise the need for more information before they can do so.

Several teachers also suggested that they would benefit from one teacher being assigned the role of “environment coordinator”, or similar, as this would allow better coordination of activities and programmes within the school.

EE continues to be viewed as a science-focussed subject and teachers without a science education background are reluctant to be involved in teaching environmental issues. Appreciation of the three pillars of sustainable development is limited, with most teachers discussing only linear linkages.

Teaching methods and approaches

Rote-learning methodology is the common approach for teaching most subjects, especially in high schools. This appears to be particularly true of classes that are taught in English or where a teacher is not wholly comfortable in her or his knowledge of the topic. Teachers write notes on the blackboard or teach directly from textbooks, giving students little opportunity to talk about issues or question concepts. Samoa’s *Education Policies 1995–2005* highlights this “over-reliance on rote-learning methods, and a general lack of creativity in classroom approaches”, noting that it limits possibilities for teaching and learning in most subject areas (DOE 1995).

Primary school teachers report using learning games, group work and cooperative problem-solving in their lessons but it is more common to see students in classes working quietly at their desks or listening to the teacher.

Both primary and secondary school teachers organise field trips and other outdoor activities as part of the learning process and these include visits to government departments, such as the Meteorology Department, the new landfill (at Tafaigata), and mangroves and coastal areas. Transport costs are a constraint however, and visits away from the school are kept to a minimum. Schools often request allowances for bus fares if they are invited to participate in competitions or other events that require travel away from the school.

Resource and expertise availability

Textbooks and related materials

Over the years, a significant number of resources have been produced with the aim of facilitating EE in Samoan classrooms. Many of these resources were developed either NGOs or through SPREP in collaboration with the CDU and the MNRE. These include teachers' and student manuals on marine conservation and climate change (Years 7 and 8), a series of storybooks for primary schools, and a *Mangrove Field Study Guide* (Years 7 and 8). Other non-Samoan specific materials have also been made available directly to the CDRC such as the *EE Teachers' Manual*, the *Pacific Freshwater Education Kit*, the *Coral Reef Handbook*, *What a Waste*! comic book, and the *Waste World* and *A Mangrove Story* videos. Many of the materials are in the Samoan language. In recent years, MNRE has also recently produced a field guide (*Mangroves of Samoa: Status and Conservation*), which is due to be distributed to schools as part of an environmental information kit.

It is evident however, that most of the materials either do not make it into the classroom or, if they do, they are not often used by the teacher. While it was not possible to conduct an in-depth analysis of why this is the case, discussions with teachers and CDRC staff suggest the following reasons:

- Teachers are not sure how to make the best use of the materials;
- Teachers are unwilling to commit the time required to read and understand the information If the materials are in English;
- Materials are produced in inadequate quantities and are often one-off print or production runs (so new teachers seldom have access to them); and
- There is no formal method of assessment or evaluation associated with the materials so teachers are often not motivated to use them.

Those teachers who do use the resources have, in most cases, attended training workshops, are personally motivated about EE and their teaching programme in general, and exhibit a confidence about experimenting with their teaching styles.

General resources

Teachers and students have access to the National Library of Samoa, the Information Resource Centre at SPREP, and MNRE's resource centre. These resource centres are part of the Pacific Environmental Information Network, which enables environment-related material from around the region to be sourced and made available to teachers and students (as well as other members of the public). Students tend to visit the SPREP Information Resource Centre regularly for assistance with

school research projects on coastal management, mangrove conservation, climate change and similar issues.

Access to and use of the Internet and media

The Internet is also fast becoming a common means of communication in the urban areas. Some schools have access to Internet, newspaper and the radio are the main media used in Apia.

Availability and use of experts

In addition to resource material, teachers in Apia also have access to experts from MNRE, other government organisations, as well as various regional and international organisations based in Apia. The SPREP Training and Education Centre, in particular, hosts school visits and gives presentations on specific issues at the request of schools. These opportunities are well used by some schools in the area.

Extra-curricular activities and external relations

Schools participate in a variety of non-curriculum activities. Examples include gardening projects (often linked to a health and nutrition programme), participating in competitions (environment, health, world heritage), participating in events and observations such as World Food Day, World Environment Day, National Environment Week, Arbour Day, International Ozone Day, Biodiversity Day and National Cleanup Day.

Such programmes are usually initiated externally by organisations such as MNRE, SPREP, the United Nations Food and Agricultural Organization (FAO), UNESCO and others. Schools choose whether or not they wish to participate. Many of these programmes require student involvement through some sort of action, such as planting a tree, collecting rubbish, or drawing a poster. Other programmes, such as the recent SPREP-coordinated “Postcards from the Future” initiative and various MNRE-run activities provide opportunities for deeper consideration of environmental and sustainability issues by inviting young people to share their own thoughts and visions for the future.

Partnerships between schools and the private sector have not been common, although this is changing as businesses seek to appear socially conscious and school management becomes more aware of what they can gain from such partnerships. One example is that of a plastic bottle recycling programme between a Japanese-owned company and several schools in the Apia area (see Box 8). While the value of these programmes with regards to building sustainability ethics in

children may be limited, such programmes do get children thinking about issues that are otherwise largely ignored. A recent national quiz on climate change was also highly successful in engaging the private sector (see Box 9).

Box 8: Recycling: Learning the value of rubbish

Recycling has come to be viewed globally as a necessary way of life if we are to become serious about managing our ever-increasing piles of waste. The concept has been promoted with great zeal in the Pacific Islands region, and the "3Rs" (Reduce, Reuse, Recycle) or the "4Rs" (Refuse, Reduce, Reuse, Recycle) phrases are becoming increasingly common.

A private company in Apia aims to strengthen the connection between recycling and producing new products. Yazaki Inc has been coordinating a waste separation programme that encourages students to return their plastic bottles to collection areas, rather than with other rubbish. The plastic bottles are sent overseas where they are processed into heavy duty outdoor furniture. These benches and tables are then delivered by Yazaki to the participating schools, thus "closing the loop", according to Yazaki's Marketing Manager, Mr Oliva Vaai.

The initiative offers an opportunity for young people to appreciate the value of their "waste" and to perhaps be motivated to participate in waste separation programmes.

Box 9: Educating through competition

Teaching about climate change and adaptation tends to be problematic for many teachers. For many, the science is often difficult to comprehend, let alone impart to barely-interested young people. All this has changed with a pioneer project initiated by MNRE in partnership with the Ministry of Education, Sports and Culture and the television company, Lau TV. The Climate Change Quiz Competition involved colleges from all over Samoa and was televised live over a period of three nights.

The public aspect of the competition encouraged the interest and support of school principals, teachers and parents and many schools gave participating students class time to prepare for the competition. As one teacher described it: "students went into overdrive, organising special sessions

with their teachers, researching and learning more about climate change than they would have in their normal lessons."

Competition organisers believe that the live coverage of the competition helped secure the interest and participation of the local community and provided an excellent channel for raising public awareness on climate change. The success of the competition is such that plans are in place to make this an annual event for Samoa schools.

Summary

Curriculum-based EE in Samoan schools occurs mainly through the science and social science learning areas. The curriculum for these areas is very specific on the need for development of responsible attitudes and clarification of values relating to the environment and society in general and provides for substantial environment content within the science and social science subject areas. Implementation of this curriculum, however, is constrained by a number of factors.

EE and awareness is also promoted extensively by SPREP and the MNRE through national environmental awareness days and other campaigns. Schools are often recruited to assist with cleanup days, participate in environment-themed competitions, and help launch newly developed EE resources.

The study suggests that the following needs must be addressed in order for EE to succeed:

1. Improving teachers' understanding of what constitutes environmental and sustainability education, and the approaches required for such education;
2. Training teachers to apply more student-centred and critically reflective learning approaches; and
3. Improving professional development in the use and application of the range of resource materials available to schools.

Environmental education in Vanuatu's schools (Efate)

Background

EE in Vanuatu has been identified as a priority in the National Environment Management Strategy and the National Biodiversity Strategic Action Plan. The Environment Unit, which is part of the Ministry of Lands, Survey, Energy, Environment, Geology, Mines and Water Resources, has chief responsibility for environment issues, including EE and awareness. Currently, the Environmental Education Officer is on leave, and was not available for comment when this study was undertaken.

The Environment Unit has, in the past, conducted a number of awareness workshops, including workshops for teachers, developed posters and other awareness materials, and organised some schools visits. All these activities have been conducted in largely an *ad hoc* manner and often to meet the objectives of funded projects, rather than with any long-term strategy in mind.

Schools-based education by the Environment Unit has been limited at best with some teachers' workshops being conducted several years ago. Any current schools-based EE is occurring through NGOs such as Wan Smol Bag Theatre and Live and Learn EE and through the curriculum itself.

Vanuatu's education system is currently going through a period of great change. The Vanuatu Education Sector Strategy envisions an education system that will provide "every young person with the lifelong skills, values and confidence to be self-reliant and to contribute to the development of Vanuatu…" (Vanuatu Government 2007). To this end, it proposes a number of changes to the current system, including revising the curriculum to provide for more relevant learning for all students.

Children in Vanuatu begin school at age five with Early Childhood Education, and progress to primary school (Years 1–8) and secondary school (Years 9–13). Years 7 and 8 have been introduced only recently in primary schools as prior to this, students sat a selection exam in Year 6 and proceeded to secondary school (Year 7) at the end of this year. The increased two years of primary schooling has led to some teething problems, including a lack of space in many schools to accommodate the increased numbers of students. Many teachers are also grappling with preparing for the new Year 8 selection exam without having the supporting textbooks and other resources.

Learning takes place in either English or French, depending on the school, although there is a plan to encourage bilingual schools.

National curriculum and policy

The current school curriculum addresses environmental issues in the social sciences and geography, science and agriculture curriculum. Issues such as marine studies and coral reefs, forests, climate change and nature conservation are covered, at least in part, in the upper primary and secondary curriculum. In primary school, environment-relevant issues include turtle conservation, composting, health and nutrition.

There have been several attempts by various NGOs and other groups to integrate environment, sexual health and reproduction, peace, civics and other issues into the curriculum. While the Ministry of Education has attempted to accommodate all these requests, it is clear that the curriculum has been over-filled and as one official put it, is resulting in “desensitisation of both students and teachers” to these issues.

The planned curriculum review, which will include the introduction of ‘life skills’ in primary school is expected to accommodate many of the afore-mentioned concepts and will also provide for development of values, leadership skills, and environmental responsibility.

School culture and organisation

EE policy

Schools do not have a specific EE policy but there are school rules and other processes to ensure clean school grounds and surrounds. Rubbish and paper are sometimes separated in city area schools but the rest is incinerated. Some schools participate in additional activities relating to turtle conservation or coral reef management. These projects are initiated by organisations outside the education system.

Church-run schools tend to have strong policies on character and leadership development and focus on this both within the intrinsic curriculum (through religious studies) and the overall teaching programme of the school.

Decision-making processes

Decision-making processes differ between schools. In some cases it is clear that decision-making is very strongly in the hands of the principal, while in others there are more consultations with teachers, parents and the rest of the community.

Most schools have a prefect or monitor system that encourages student responsibility for school activities.

Peer support and professional development opportunities

Although regular teachers' workshops were available some years ago, there are currently few opportunities for teachers to gain professional development through the Ministry of Education. This is mainly due to government budget issues and to the current education reform programme. NGOs such as Live and Learn EE and Wan Smol Bag offer support for teachers through their own programmes (and some teachers' workshops), but these are often issue-focused.

Teaching and learning process

Environmental knowledge and familiarity

Teachers from both primary and secondary schools noted the need for better understanding of environmental issues in order to teach about them effectively. Most teachers are aware of various environmental issues including biodiversity conservation, water conservation, climate change, deforestation and logging. Social studies teachers also explained that they are required to teach about regional organisations as part of the curriculum requirement, and hence they are aware of SPREP and its activities. Concepts of sustainable development are limited to natural resource management and conservation.

Teaching methods and approaches

Most primary school teachers appreciate the importance of the use of student-centred teaching methods and tend to use group work and various activities in their lessons. At the secondary level, those teachers who have recently attended a teacher-training programme tend to be more student-focused than their colleagues, and provide opportunities for students to learn by investigation and through group work and discussion. Generally however, teachers appear to be more comfortable with more traditional approaches that are largely teacher-centred and didactic in nature. Some teachers mentioned that even though they were aware of the concept of critical thinking, this was difficult to apply in the classroom because of students' cultural backgrounds, which often

discourage independent thought or questioning actions of adults. Other teachers tend to be more innovative, identifying additional sources of information and encouraging students to learn outside the curriculum (see Box 10).

Resource and expertise availability

Textbooks and related material

Textbooks appear to be a significant problem for all schools. The Ministry of Education (through its Curriculum Development Centre) issues teaching guides for all subjects and has developed a number of resource books in line with syllabus requirements. However, print runs for books are often insufficient to cater for replacements of lost or worn materials, resulting in depleting textbook stocks and teaching materials throughout schools.

A very comprehensive environmental science resource book was developed in 1991 (reprinted in 1997) for use at Year 10 level. The handbook provides for integration of environmental topics into various subject areas in the science syllabus but it is not clear whether the book is being used by teachers.

There is currently a moratorium on the development of new materials due to the education sector reform and proposed curriculum review. It is expected that this will allow materials to be developed in line with the curriculum rather than *ad hoc* resources that different donors and organisations hope will somehow be integrated into the curriculum.

General resources

Many of the schools that have participated in Wan Smol Bag activities have booklets on issues such as waste management, although It was not clear whether the materials are used by teachers. There is a national library accessible to students and teachers who live in urban Port Vila.

Access to and use of the Internet and media

The radio is perhaps the best used media in Vanuatu as television is limited to the Port Vila area and areas where there is electricity. The Daily Post is a newspaper delivered around the island of Efate and several teachers mentioned their reliance on this for updates on current affairs. The Internet is extremely expensive in Vanuatu, and only available in areas with a phone line so it is currently not a feasible means of communication or information dissemination for teachers and students.

Box 10: SPREP Director articles encourage classroom learning

One high school teacher has not let the lack of readily available resources deter him from teaching about the environment. Mr Kalanure Kalfatak is the principal of Ulae School, which is about an hour's drive from Port Vila. With no telephone, Internet or television, the school relies on the radio and a daily newspaper for current affairs information. Mr Kalfatak also subscribes to the regionally-produced *Pacific Islands Business Magazine*, which sports a regular series of articles by the Director of the region's premier environmental organisation — SPREP. Mr Kalfatak uses some of these articles as reading and comprehension material for his Year 10 English class. Referring to it as "killing three birds with one stone", he says that students get to learn English, a bit of current affairs and of course, new concepts about the environment.

Availability and use of experts

Expertise in different environmental issues is housed in government organisations, such as the Environment Unit, Ministry of Fisheries, Meteorology Division and others. However, teachers explained that they were not comfortable approaching these organisations for assistance. It was suggested that the organisations should make information available on what they do and what sort of assistance they can provide schools. This will allow teachers to approach the right organisations (or individuals) without feeling that they are wasting people's time.

Extra-curricular activities and external relations

The types of extra-curricular activities offered by schools range from gardening through to environmental clubs, participation in cleanup days or more long-term care of the environment around the school. Wan Smol Bag Theatre and Live and Learn EE both have in-school programmes that encourage student participation in caring for their surrounds and developing environmental clubs.

Many principals and teachers like the idea of environmental clubs but require information on how to establish these.

Summary

Education about the environment occurs in Vanuatu's schools mainly through the current curriculum. Much of this learning occurs in an uncritical manner and often without real relevance to the students themselves.

The generally poor quality of school facilities and lack of resources, including textbooks and stationery, are possible factors that discourage teacher innovation in teaching approaches.

Box 11: Empowering teachers in Vanuatu — Wan Smol Bag Theatre

Nothing is more powerful than the imagination, and Wan Smol Bag Theatre's recent video certainly proves that.

Realising the constraints teachers in Vanuatu face in the classroom, Wan Smol Bag has developed a video aimed at giving teachers a taste of a "non-conventional" classroom. "No Questions" is the story of a young teacher struggling to teach a very bored class of teenagers. She finally decides to experiment with some teaching approaches she has recently read about. These student-centred methods are first met with cynicism but slowly encourage greater participation of the students in their lessons.

Through a series of comedic and serious discussions, Wan Smol Bag presents possibilities for all teachers to move towards student-focused and interesting lessons that involve everyone.

Although fictional, the video is a valuable resource for teachers and teacher educators and is testament to Wan Smol Bag's commitment to improving the situation in classrooms and schools everywhere.

Wan Smol Bag uses theatre and drama to raise awareness of social, environmental, economic and political issues affecting communities, and develops programmes to help encourage critical reflection by different groups on these issues. The organisation currently works with communities and schools in Vanuatu, Fiji and Solomon Islands.

The curriculum is considered to be too full and not capable of usefully accommodating additional concepts without a thorough overhaul. A curriculum review is proposed as part of Vanuatu's Education Sector Strategic Programme. A proposed life skills course at primary school level offers opportunities for environmental and, in particular, sustainable development values to be incorporated into the curriculum.

Organisations such as Live and Learn Environment Education and Wan Smol Bag Theatre provide opportunities for teachers and students to participate in addressing real environmental problems through critical reflection and discussion. Teachers and school principals are generally positive towards the idea of EE as an extra-curricular subject and are particularly interested in the concept of environmental clubs. Many teachers also consider that they need more information on specific environmental issues before they would be confident enough to work with students on these.

The Environment Unit, the government agency tasked with EE in the country, is understaffed and has had limited input to schools-based education in recent years.

Chapter 4: Environmental and sustainable development education in the Pacific: Discussion

Basic education in the Pacific

It must be noted that all countries still have significant needs in basic education. These needs range from supplying adequate textbooks and providing safe and friendly school environments to improving teacher quality and reviewing outdated and irrelevant curricula. Many schools, even in urban areas, are under-resourced, relying on outdated textbooks, minimal (often untrained) staff and dilapidated buildings. Libraries, if present at all, are either poorly stocked or are set aside for teachers or higher classes only. Although schooling is said to be free and compulsory in several countries, many students are unable to attend school for a range of reasons, and selection examinations (sometimes as early as from the 6th year of schooling) result in a large number of "push-outs" who are unable to participate productively in society. The issue of teacher training, particularly in relation to pedagogy, has been identified as essential, although it is also recognised that this requires significant budgets and the long-term commitment of governments.

There are, of course, also many examples of schools with beautiful, well-maintained buildings, a full staff complement, excellent, up-to-date resources, and libraries that are well-used by students. However, other than in the Cook Islands, these are the exception rather than the norm, and these schools may reflect the affluence of the community groups they serve.

Education is, therefore, a priority for all countries and all are working towards the development of education systems that will allow greater numbers of young people to attain skills to contribute productively to their societies and thus improve their own quality of life. In addition, student-centred learning is being advocated together with the development of life skills including values, thinking skills and specific technical skills. All countries have either recently completed or are in the process of carrying out full curriculum reviews.

EE in schools must recognise and work within these constraints and opportunities.

Interpretations of EE in the Pacific

This study showed that EE is interpreted in different ways by teachers, curriculum development specialists, environmental experts and NGOs. The most common interpretation is education *about* the environment. In this case environmental topics are included in the curriculum but students mainly learn concepts and ideas ("waste can be separated into biodegradable and non-biodegradable groups") or definitions ("the term biodegradable means something that will break down in nature"). In this situation there is also a tendency to confuse the learning of science with EE. Thus, learning the parts of a flower or studying the carbon or hydrological cycle is considered "EE."

A second interpretation seen in countries is a combination of factual learning with action. Thus, students learn about waste separation but may also be encouraged by the teacher to establish a waste separation programme in the school. Or trees may be planted in strategic locations after a lesson on soil erosion. Such activities encourage students to take an interest in the world around them and help develop a sense of personal responsibility for the environment. Observations in countries suggest that generally, these actions are actually teacher-driven and do not necessarily encourage critical thinking or development of problem solving skills.

The third interpretation, while not very common in schools, involves providing students with opportunities where they can build their knowledge about an issue, develop skills to collect and analyse data, and take some action regarding the environmental issue in question.

Integration of EE in national policies and development plans

Throughout all the countries in this study, EE is not well integrated into national education and development policies and plans. In fact, it is most commonly driven by environment departments and NGOs rather than by educational institutions. While some education documents do mention the need for education on environmental issues, these statements are seldom backed with strong strategies and actions. This separation of EE from national plans has meant that inadequate human and financial resources are allocated towards its implementation. EE in most countries, therefore, relies on external support for its implementation and as a result, seldom has a long-term focus. There is a need to identify opportunities through which environmental issues can be placed firmly on the agenda of national education strategies and, where feasible, in national development plans.

EE in the curriculum

In all countries studied, at least some environmental content has been integrated into the curriculum, particularly in the sciences, social sciences and geography. Issues covered include ecosystems and food chains, deforestation, marine science and fisheries management, natural resource conservation (mangroves, turtles, birds), global warming and climate change and sustainable development (social science and geography). This content appears to have been inserted in an *ad hoc* manner with little overlap or linkages across topics. In most countries, the curriculum structure is very rigid and does not allow for automatic insertion of new topics or issues.

Curriculum developers also highlight the ongoing expectation of various regional, government and NGOs that the school curriculum is capable of continually expanding to accommodate an ever-increasing range of education programmes. Some specialists consider this "over-filling" of the curriculum dangerous because teachers and students are expected to know a little bit about everything, resulting in very little real learning taking place about anything. There is a need for the numerous regional organisations, NGOs and other groups to develop a clear understanding of their programmes and the links therein before approaching education departments to integrate these issues into the curriculum.

The focus on content in the curriculum has meant that there tends to be little focus on how positive environmental ethics or values might be developed through the teaching of these topics and issues. The curriculum statements for Cook Islands, Fiji and Samoa mention the need for developing positive values, responsibility and respect, but the actual framework and/or syllabus is mainly knowledge- or content-focused and does not usually provide for this type of education through the subject areas.

The current limitations of national curricula (with the possible exception of the Cook Islands National Curriculum Framework) raise the question of the usefulness of attempting to incorporate additional content in school curricula.

Teacher understanding of environment and sustainable development issues

In most cases, teachers' understanding of environmental issues appears to be limited to what they need to teach through the curriculum. The level of awareness and knowledge about current environmental issues among teachers is, therefore, generally limited to an understanding of ecological concepts and an awareness of environmental issues such as waste management,

climate change and nature conservation. Only some science and mostly social science and geography teachers appear to have heard of the term “sustainable development.” Where the term is used, understanding is limited to the Brundtland definition[6] and there does not seem to be much appreciation of links between environmental, social and cultural, and economic and political issues.

Most teachers are aware of the need to improve their understanding of environmental issues and also recognise the limits of their textbooks and teachers’ guides. However, few have the resources or time to carry out research to obtain the appropriate information. Others note that material produced in English is difficult to understand. Internet and other media are often not readily available to teachers and for many, the most convenient method of communication remains written matter.

There is a real and urgent need to provide teacher-friendly information that can be easily reproduced, readily updated, and which can act as comprehensive reference material for teachers on a variety of environmental issues. There is also a need in at least some countries for material to be provided in the local language.

Teaching methodologies and the examination focus

The delivery of EE through the curriculum is no different to delivery of the rest of the curriculum content. Students learn concepts, definitions and facts without a great deal of emphasis on building their own thoughts and attitudes about issues. The pressure to pass exams, as early as Year 6 in some countries, is a major factor in determining how teachers decide to teach. Teachers choose rote-learning methods as the most time-effective way to cover the entire exam prescription within the allocated time. Workshops and other training programmes do not seem to have great long-term impact on in-class teaching methods.

The expectations of society often limit how teachers may choose to teach. In many countries, a “good” teacher is one who has a quiet classroom where students appear to be diligently working at their desks. Parents often consider out-of-classroom activities to be frivolous and a waste of time and put pressure on principals to reduce such activities.

[6] The “Brundtland Report” defined sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their needs.”

Many teachers do not have formal teaching qualifications and therefore tend to emulate their own teachers (or university lecturers). Teachers are also not confident with using “alternative” teaching methods and tend to view these as additional to their lessons, rather than as something that will actually help further learning.

Field trips and some outdoor activities are encouraged by all education ministries, however these are often constrained by costs of transport, health and safety requirements, teacher motivation and, as mentioned earlier, societal expectations.

These are all structural issues that require long-term input, training and commitment on the part of the education sector. As education sector reforms begin in several countries, there are opportunities for government environmental agencies to participate in and provide input to these discussions.

Resource material and expertise availability

Schools visited in Cook Islands, Fiji, Kiribati and Vanuatu had limited EE resources, although Kiribati and Vanuatu do have student and teacher books for environmental subjects at some year levels. In Kiribati, all teachers have been provided with class sets of environmental posters and a variety of other material to assist with EE.

Regionally-produced, schools-specific material (by organisations such as SPREP, SOPAC, UNESCO, USP, and WWF videos and kits) were found in a few schools visited but these do not appear to be well used. Several schools in Samoa have SPREP and MNRE material on conservation, waste management and other issues. Samoan schools also have resources that have been developed specifically for Samoa with the input of Samoan school teachers.

It was found that regionally produced materials tend to be sent to national environment departments or to education ministries with the expectation they will be distributed during routine schools visits. Often, other priorities may take precedence resulting in the materials sitting in storage or being handed out during special occasions.

Where materials do get delivered to the school, they may end up as the personal property of the teacher to whom it is directed. Teachers will often take materials with them when they are

transferred from a school or take things home and neglect to return them. Several teachers indicated the need for training in the use of materials provided to schools.

There is a need to seriously consider the value of regional approaches versus local or nationally driven ones. It is often tempting to apply resources to developing brand new material aimed at all countries as this is what appeals to donors. However, the benefits of focusing on local and national programmes should be given serious thought, and donors should be educated on this matter.

In most cases national environment agencies (units, departments or ministries) host the primary expertise in various environmental issues, but there seems to be a general tendency for these agencies to take a back seat in schools-based education. This may be due to lack of human resources and funding or simply to internal difficulties in working with the education sector. This lack of engagement on the part of national environment agencies may be contributing to a lack of coordination of school-based programmes and teaching of issues identified as priorities for the country.

Government environment agencies are the first point of call for environmental issues and have responsibility for identifying and addressing national environment priorities. A proactive stance by government agencies will help ensure that environment education is coordinated and focuses on national priorities (rather than those of donors or implementing agencies).

Learning outside the classroom and use of mentors

The most successful EE appears to take place outside specific subject areas. School-based programmes that promote critical thinking, problem-solving, discussion and other student-centred learning methods are demonstrated to support teachers in the schools. Such approaches also help to remove the major concern among teachers of being unable to teach certain subject matter through their scheduled classes. These programmes are also more successful in addressing the need to build positive environmental ethics and attitudes among students.

Environmental clubs, community youth awards and other non-curriculum focused education programmes can also provide opportunities for young people to develop an interest in environmental issues without having to study these in a classroom context.

EE and education for sustainable development (ESD)

ESD was accepted as a regional imperative in the Pacific with the establishment of a working group by the Council of Regional Organisations in the Pacific (CROP) in November 2006. The Pacific Education for Sustainable Development Framework was developed by this working group, and consists of organisations such as SPREP, USP and UNESCO, and was endorsed by the Pacific Forum Education Ministers in 2006. A draft Action Plan to implement the framework is currently undergoing consultation and scheduled for completion in late 2007.

Can EE in schools contribute effectively to the goals of ESD?

A recent study in Australia suggests that the contribution of EE to sustainability in the school sector requires more than the inclusion of sustainability content in the curriculum. It requires "a fundamental shift in current practice" and the "establishment of whole school approaches to learning for sustainability that consider the infrastructure, management, curriculum and teaching approaches of the school." (Tilbury et al. 2005).

On the whole, it is clear that, for the five Pacific Island countries studied, the current state of the curriculum, the exam-based assessment system, teacher capacity, understanding of what constitutes EE, and societal expectations of schooling are highly restrictive in terms of encouraging the (effective) application of EE for ESD. The tendency to view EE as environmental science or environmental studies (education *about* the environment) further limits this ability. This focus on teaching facts and concepts has meant that the goals of EE (i.e. changing attitudes and developing environmental concern) are generally neglected. If EE is to contribute to ESD, its focus in the curriculum (and throughout the school system) will need to be reoriented.

It is also worth noting that EE is just one potential contributor to ESD. Other education programmes (including peace, civics, human rights, gender, governance and health) must also address the same challenge. In the longer term, the proponents (the UN system, regional agencies, NGO networks) of these programmes must consider working more collaboratively to strengthen their overall contribution of these efforts to sustainability.

This study suggests that the principles of ESD are being applied to some degree through some of the more critically reflective EE being carried out in some schools. The key opportunities for steering EE towards more sustainability-focused education appears to be through these external programmes.

The CROP ESD Working Group further offers an opportunity for regional coordination and Pacific-focused research in environment and sustainable development education.

ESD is a new and constantly evolving concept and process, and there is a need to remain involved in the dialogue and to be open to innovations and ideas that may challenge the current way of thinking.

Chapter 5: Strengthening capacity and providing support for sustainable development education in the Pacific

The following recommendations are provided for consideration in building country capacity and developing the overall effectiveness of EE in sustainable development.

Input to national policy and planning

- Develop a well-researched briefing paper for consideration and further action by Ministers of Environment on the long-term economic, social and environmental benefits of integrating critically reflective environmental and sustainability education approaches in schools.
- Strengthen the capacity of national environmental agencies to participate in and provide input to education sector reform discussions.
- Strengthen the capacity of national environmental agencies to establish formal relationships with the education sector and take responsibility for coordinating school-based education.

Increase teacher knowledge and understanding of environmental issues

- Produce easily reproducible and regularly updated teacher-friendly information sheets that can act as comprehensive reference material for teachers on key environmental issues.
- Provide support at the national level for translation and reproduction of information materials into local languages to assist teacher understanding.
- Produce regular information updates on environmental issues that can be easily translated, where needed, and disseminated to schools.

Development and use of education resources in the region

- Conduct a regional evaluation of selected regionally and nationally produced EE resources and kits to determine their use and effectiveness in schools.

Produce guidelines for developing educational resources and provide national-level assistance with the development of nationally relevant resources in line with their own curriculum and education processes, and national priorities.

- Convene cross-sectoral and inter-agency workshops at the national level to encourage teachers to use a range of available information and education resources within their current teaching practices.

- Provide mentoring or other forms of ongoing support for teachers to encourage application of good EE practices in the classroom or school system.
- Identify positive stories of teacher innovation and use the media to educate parents, the business community and government ministers on the long-term value of alternative approaches to education.

Establishment of partnerships

- Develop strategic relationships between SPREP and national ministries of education, curriculum development programmes and teachers' associations to ensure effective and ongoing communication with these organisations.
- Identify the different international, regional and national groups (including members of the CROP Working Group on ESD, UN agencies, and NGO networks) currently involved in school-based education initiatives; seek to develop and/or strengthen affiliations between these groups; encourage national and regional coordination; and promote synergies with the various initiatives (including peace, gender, culture, natural disasters, and ESD).
- Support and encourage research to further environment and sustainable development education in the Pacific Islands region.

Extra-curricular and non-curriculum approaches

- Develop programmes to encourage more non-curriculum focused education programmes, such as community youth awards, environmental clubs, and other activities that can be conducted outside school time (e.g. lunch time, after school, weekends), where possible.
- Build relationships with programmes in other developing nations, in particular, with other small island developing states, and analyse and apply these experiences to the Pacific context.

Financing

- Research potential financing opportunities from non-traditional sources, in particular the private sector and foundations, for national and regional activity.

References

Bektas A. 1992. *Review of EE Curriculum.* SPREP: Apia, Samoa.

Breiting S., Mayer M. and Mogensen F. 2005. *Quality criteria for ESD schools – Guidelines to enhance the quality of education for sustainable development*. Australian Federal Ministry of Education, Science and Culture (downloadable document from www.seed-eu.net).

DOE (Department of Education). 1995. *Education Policies 1995–2005.*Prepared by the Education Policy and Planning Project. Apia: Government of Samoa.

Fien J. 1993. *Education for the environment: Critical curriculum theorising and EE*. University Press: Victoria, Deakin

Government of the Cook Islands. 2002. *Cook Islands Curriculum Framework 2002*

Government of the Cook Islands. 2002. *Ministry of Education five-year plan (draft June 2002).*

Government of the Cook Islands. 2004. *Ministry of Education 2004–2005 annual report*

Government of the Cook Islands. 2003. *Ministry of Education 2003–2004 corporate plan*

Government of the Cook Islands. 2006. *National Sustainable Development Plan (2007- 2010): Te Kaveinga Nui (Pathway for Sustainable Development in the Cook Islands) — Living the Cook Islands Vision – A 2020 Challenge.* Report prepared by the Central Planning and Policy Office (Office of the Prime Minister) and the Economic Policy Division (Ministry of Finance and Economic Management). Avarua. Available: http://www.sprep.org/att/IRC/eCOPIES/SUSTAINABLE%20DEVELOPMENT/Cook_Islands_nsdp_draft.pdf

Government of Kiribati. 1996. *National Development Strategy 1996-1999.*

IUCN (World Conservation Union). 1970. *Our common future.* Oxford University Press: Oxford, England.

Ministry of Education. 1995. *Western Samoa Education Policies 1995-2005.* Government of Western Samoa.

Ministry of Education 1999, *Education Master Plan*, Government of Vanuatu, Port Vila.

Ministry of Education 2004. *Ministry of Education Corporate Plan 2002-2006*, Government of Vanuatu, Port Vila

Ministry of Education 2001. *Education For All Vanuatu: National Action Plan 2002–2006,* Government of Vanuatu, Port Vila.

Ministry of Education Cook Islands. 1997. *EE Activities in Social Science: a teachers' guide for Years 5 and 6.*

Ministry of Education Fiji 2006. *Educating the Child Holistically for a Peaceful and Prosperous Fiji: Strategic Plan 2006–2008*,

MESC (Ministry of Education, Sport and Culture). 2006. *Draft National Curriculum Policy Framework.* Apia: Government of Samoa.

MEYS (Ministry of Education, Youth and Sport). 2004. *Responding to a Rapidly Changing Environment: Ministry Operational Plan 2005–2006.* Government of Kiribati.

Monroe M. 1999. *What works — a guide to EE and communication projects for practitioners and donors*. New Society Publishers: Academy for Educational Development, Washington.

Muralidhar S. 1989. *An exploratory study of a science curriculum in action: Basic science in Fiji*. PhD Thesis, University of the South Pacific.

Palmer J.A. 1998. *EE in the 21st century: Theory, practice and promise*. Routledge Press: New York, USA.

SPREP.1999a. (unpublished). Report of primary teacher training workshop, 23–27 August 1999.

SPREP. 1999b (unpublished). Report on Kiribati environmental studies resource materials project 1994: in-house report.

SPREP. 2003 (unpublished). Review of the Pacific Regional Action Strategy for Environmental Education and Training, 1999-2003

Taylor N. 1993. *Review of EE – Kiribati*. SPREP: Apia, Samoa.

Taylor, N., & Macpherson, C. (1993). Environmental education in Fiji. *International Research in Geographical and Environmental Education*, 2(1), 3-10.

Taylor N. and Topalian T. 1995. "EE in the South Pacific: An evaluation of progress in three countries." *The Environmentalist* 15:159–169.

Tilbury D., Coleman V. and Garlick D. 2005. *A national review of EE and its contribution to sustainability in Australia: School education – key findings*. Australian Government Department of the Environment and Heritage and Australian Research Institute in Education for Sustainability (ARIES): Canberra, Australia.

Tilbury D. and Wortman D. 2005. *Engaging people in sustainability*. Commission on Education and Communication, IUCN, Gland, Switzerland and Cambridge, UK.

UNESCO. 2002. *Education for sustainability from Rio to Johannesburg: Lessons learnt from a decade of commitment*. UNESCO: Paris.

Vanuatu Government. 2007. *Vanuatu Education Sector Strategy: 2007–2016*. Government of Vanuatu.

WWF Cook Islands. 2004. Te Kaveinga Ora no te Aorangi – A strategy for EE in the Cook Islands.

.

Other Documents Reviewed

Fiji

School Text Books for Classes 1–5 and Forms 3, 4, 5 and 6

Kiribati

Environmental Science Syllabus Classes 1–6

Environmental Science Assessment Papers Classes 3 and 5 (2006)

Samoa

Curriculum Statements for Social Studies and Science (Years 9–11)