

# TEACHERS' MANUAL

## Education for a Sustainable Environment



# Green Schools Fiji

**Prepared by: Christian Nielsen and Viliame Rabici**



ACEID



UNESCO



Canada Fund



Live & Learn

## **Green Schools Fiji; Education for a Sustainable Environment.**

A joint project between the Live & Learn Environmental Education, the Curriculum Development Unit and Fijian Teachers Association.

### **Project Coordinators:**

Viniana Kunabuli, Senior Education Officer (Basic Science).

The Curriculum Development Unit, Suva.

Aleksio Sela, Senior Education Officer (Geography).

The Curriculum Development Unit, Suva.

Susana Tuisawau, President.

The Fijian Teachers Association, Suva.

Maika Namudu, General Secretary.

Fijian Teachers Association, Suva.

Christian Nielsen, Regional Director / Programme Development.

Live & Learn Environmental Education, Suva.

### **Prepared by:**

Christian Nielsen and Viliame Rabici.

### **Graphics Design and Desk Top Publishing:**

Susanna Xie - Xivine Studio Ltd., P.O Box 12717, Suva, Fiji Islands.

### **Artwork:**

Tomu Vorenidoga

Waisomo Village, Ono

Kadavu - Fiji Islands

### **This manual was produced by:**

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Christian Nielsen

Viliame Rabici

Suva 2000

# **Introduction**

The Greens Schools Fiji project is build on the recognition that teachers play a vital role in creating a sustainable environment through education. It is also build on the recognition that the global environment is rapidly deteriorating and that local action is needed.

The Greens Schools Fiji project suggests that sustainable change to improve the environment starts with self-reflection and critical thinking about our own attitudes, values and behavior towards the environment and each other.

Through the Green Schools Fiji project teachers are invited to attend workshops throughout Fiji on how to use this manual. These workshops aim to assist teachers develop environmental educational projects that will encourage students to participate in improving the local environment and their own attitude towards the community environment as a whole.

LINKING KNOWLEDGE TO CHANGE



## Fiji's Environment

Fiji's 1996 population of 775,077 at a density of 41.1 person/square kilometre can be considered modest, but this average conceals densities in excess of 170 persons/square kilometre of arable land. Over 60% resides in rural areas, but migration to urban areas is significant and increasing. During the next twenty years the country will be transformed from a predominantly rural residency and lifestyle to a predominantly urban one. This has widespread and profound implications for the environment.

Fiji is an archipelagic nation consisting of more than 300 islands scattered over 1.3 million square kilometres of the South Pacific Ocean. The two large mountainous islands of Viti Levu, where 75% of the population resides, and Vanua Levu comprise 87% of the total land area. The mountainous terrain limits the area of land available for extensive development to coastal areas and is subject to earthquakes and landslides. The larger islands have limited arable soils capable of supporting intensive agriculture (19.5% of land) with a further 10.5% capable of being productive with only minor changes. Nearly 70% of Fiji's landmass requires either intensive land management or is unsuitable for agriculture use.

On the larger islands a relative abundance of annual rainfall, perennial rivers, good surface drainage and numerous springs ensure that there is no domestic water shortage. On the low-lying smaller and outer islands where there are no perennial streams, freshwater is a much scarcer resource.

In such situations shortages are of common occurrence not so much as a result of lack of rainfall overall but because of deficiencies in water collection. The government is then called on to provide water at great expense.

The coastal zone is of vital importance. It brings together a unique assemblage of resources such as reefs, mangroves, water, agriculture and seafood. The current estimate of mangrove forests is that approximately 42,000 hectares remain of an original resource of 45,000 hectares. Mangroves sustain marine and coastal ecosystems that support both basic subsistence and a growing commercial fisheries sector.

The western Pacific has the highest marine diversity in the world and Fiji has one of the best-developed coral reef systems in the Pacific. All the major reef types are represented. There is no inventory of Fiji's marine plants but several species have become extinct in recent times and many others are in danger of becoming extinct. Unique marine features such as lakes and marine caves occur in Ogea and Vulaga lagoons.

Fiji's vegetation and wildlife diversity is relatively small in number but are of exceptional scientific and genetic interest because of the high proportion of endemic (unique) forms. Their heritage and potential tourism values are greatly underrated. Rain forest is the dominant terrestrial ecosystem. Its form varies with elevation and rainfall. Today little, if any, undisturbed forest remains.

Fiji's origin as an isolated oceanic island makes its fauna and flora very vulnerable to adaptable and aggressive introduced species. The ravages of the mongoose bear vivid testimony of this.

# The State of Fiji's Environment

- Agriculture:** The almost complete utilisation of Fiji's agriculturally useable land has seen the expansion of agriculture into hills and steep land. Due to the heavy increase of erosion steep land sugar cane and ginger production is not sustainable. This erosion and loss of topsoil is causing sedimentation and pollution of Fiji's rivers and streams
- Logging:** Since the mid- 1960s more than 16% of Fiji's national forests have been converted into non-forest land. There is an imbalance in the distribution of loss of forest types; with the lowland forests on both the larger and smaller islands have suffered major losses. The principal causes of deforestation are extensive commercial agriculture, logging, fire and development projects.
- Fisheries:** The only significant long term development prospects for Fiji in terms of fisheries are likely to be in the offshore areas, particularly pelagic. The inshore fishery is of vital importance to the majority of the population who are costal dwellers. Overfishing is widespread in the more heavily populated localities and management measures need to be improved if this vital fishery is to be maintained. Classic "boom or bust" exploration of beche-de-mer and clams has recently occurred in Fiji. These resources should have been managed sustainably for the benefit of costal villagers. Traditional fishing rights owners can be a potent force for fisheries conservation since the owners of each qoliqoli presumably have a paramount interest in protecting the resource for their own future benefit. But in recent times owners of the qoliqoli are becoming involved in business and, in certain cases, consider the qoliqoli as a disposable income.
- Marine pollution:** The extent of marine pollution is so severe in the Suva area that the consumption of seafoods from certain areas is a human health hazard.
- Water supply:** Water conservation and awareness is very much needed in Fiji as most people consider water as an abundant resource and waste is common.
- Urban growth:** Almost 39% of Fiji's population live in urban areas and this proportion and growth rate are both increasing. In part this is a reflection of the deterioration of economic and social conditions in the rural sector. The increase in urban growth places demands and pressure on services and infrastructure.
- Tourism:** Tourism is Fiji's biggest foreign exchange earner and is therefore a major contributor to the economy. Although responsible for some avoidable environmental impacts tourism offers considerable opportunities for sustainable development through enhanced linkages with the environment.
- Energy:** Fiji has benefited greatly from the commissioning of the hydro-electricity from the Monasavu Dam. Industrial diesel oil imports dropped by two thirds between 1983 and 1990 saving Fiji more than 170 million dollars. Public awareness of energy conservation is at a low level and requires improvement to increase energy efficiency.
- Waste:** Waste management in Fiji is a national problem that needs a new firm initiative. No refuse dump in Fiji is managed to an acceptable standard.

# What is Environmental Education?

Environmental Education has been recognized as a key weapon against environmental deterioration even though educators and teachers throughout the world still differ in their understanding of Environmental Education.

The definitions of Environmental Education have been written into numerous international charters. UNESCO adopted following the principles as the guidelines for Environmental Education:

- Environmental Education considers the environment in its totality such as ecological, political, natural, technological and sociological.
- Environmental Education is a response to the challenge of moving towards an ecological and socially sustainable world.
- Environmental Education recognises the value of local knowledge, practices and perceptions in enhancing sustainability.
- Environmental Education is interdisciplinary and can be taught across the curriculum.
- Environmental education focuses on current and future perspectives on the environmental conditions.
- Environmental Education emphasises participation in preventing and solving environmental problems. It should foster and arouse a sense of personal responsibility, motivation and commitment.
- Environmental Education develops the skills:
  - *To identify alternative solutions for the environmental situation.*
  - *To clarify the values associated with these solutions.*
  - *To use these values to make decisions about which alternative to use.*

**In order for Environmental Education to reach its full potential the teacher and the student need to reflect on his or her own values and attitudes towards the environment. Conventional teaching styles need to be complemented with action-based activities where schools, teachers and students critically reflect on their responsibility towards their own school environment and their role in the community as a whole.**

Green Schools Fiji emphasises a research action-based approach to Environmental Education where teachers and students together monitor and evaluate their own values, practice and progress in improving the environment. The programme does not seek to replace existing educational practices but rather use them and link them to change. Green Schools Fiji was developed to strengthen the existing Environmental Education foundation in the formal schools system in Fiji and therefore links with subjects across the curriculum.

# What do we want Environmental Education to do?

During a workshop at the Ratu Rusiate Memorial School in Nailaga Village near Ba 40 teachers were asked what they wanted Environmental Education to do.

This challenge was enthusiastically met by the teachers through the following responses.

- *Enhance the love and appreciation among students towards the environment.*
- *Assist children in Fiji to value what belongs to them and about the traditional ways of preserving the environment.*
- *Create awareness and responsibility towards the environment.*
- *Develop children's awareness of the political and technological environmental forces.*
- *Educate elders and our chiefs about the value of our plants.*
- *Educate Fiji's children on the importance of keeping a balance between population and resources and how to manage it sustainably.*
- *Promote healthy attitude towards the environment that creates change.*
- *Change attitude that will improve the environment.*
- *Teach children to tackle environmental problems.*
- *Create ownership on traditional aspect of the environment.*
- *Promote attitudes which brings about a clean, safe and healthy environment.*
- *Promote a deep appreciation for trees.*

Above responses only represent a few of the 250 suggestions from teachers on what Environmental Education should do for people and the environment.

The first priority among teachers focuses on attitudes and values. The second on awareness and understanding.

The views of the teachers are consistent with many international views on Environmental Education. UNESCO has identified the goals of Environmental Education to be the following.

- To enable people to understand the repercussions that their lifestyle and actions have on resources now and in the future, locally and globally.
- To increase people's awareness of economic, political, social, cultural, technological and environmental forces which fosters or prevents environmental sustainability.
- To develop people's awareness, skills and values, enabling them to effectively work towards an equitable and sustainable future.

***The Green Schools Fiji project will focus on a learning process that endeavors to improve attitudes and values towards the environment. The project will not provide information about the environment as this will compromise the students' opportunity to investigate and research environmental problems and it may also compromise indigenous knowledge held in the community.***

# How do students perceive the environment?

Talking to students about their environmental perceptions is a valuable tool for the teacher before planning Environmental Educational activities.

Students sharing their perceptions will assist the teacher to:

- Clarify the student's values and priorities.
- Challenge the student's methods of identifying, investigating and solving environmental challenges.
- Maximise the student's ability to look at issues objectively
- Develop sustainable learning outcomes.

It remains critically important for the teacher to question students and make them justify their perceptions. Students with perceptions that will lead to environmental degradation have, during the learning process, the opportunity to reflect on their own values and priorities in regard to future generations, human sustainability and rights of all races and gender. The students should not be limited to local conditions but should be encouraged to understand global ecological and social dynamics and how to make a change at a local level.

This can be a controversial learning process as students perceive the environment differently and have different moral and religious values. The teacher should protect the integrity of this learning process and allow all students to have an opportunity to clarify their perceptions.

## Students' Perceptions

ON THE ENVIRONMENT	STUDENTS' RELATIONSHIP TO THE ENVIRONMENT	STUDENTS' VIEW	LIKELY PREFERRED ACTIVITIES
As nature	To be appreciated, respected, preserved.	The purist view of nature.	Field trips to the reef, rainforest or wetlands.
As a resource	To be managed.	Sustaining quality of life.	Science project.
As a school project	Something in which to get involved with.	The focus of self-reflection and analysis.	Participatory process aimed at change. Group work.
As a place to live	To know and learn about, to plan for, to take care of.	Our daily living with the environment. Interest in local and traditional knowledge.	Storytelling, greening of school grounds, recycling project.
As a problem	To be solved.	Environment and humans under threat from environmental problems.	Problem solving strategies and case-studies.

# "Best Practice" in Environmental Education

"Best Practice" in Environmental Education is manifested through three aspects:

- **What and how are teachers are teaching?**
- **What learning outcomes are students gaining?**
- **Is the Environment likely to improve from the learning outcomes?**

Best practice is tied in with teaching methodologies, the teacher's personal values towards the environment and community involvement. What counts as "Best Practice" will vary from school to school, from teacher to teacher but after this workshop it may be valuable for the teacher to self-reflect on the issue of "Best Practice".

## **Teacher Reflection:**

- **I have to think more about 'best practice' in Environmental Education because.....**
- **I think that the idea of 'best practice' in teaching "Green Schools Fiji" ought to refer to.....**
- **One of the best examples of 'best practice' in Environmental Education I have ever seen was when.....**

## **Values Education.**

Clarifying students' values is an important aspect of Environmental Education as it helps the students to self-reflect and increase their awareness of their own values. The teacher can assist the student to clarify their values by encourage the student to:

- Fully understand their values.
- Freely choose their values.
- Be willing to consistently act upon those values.

Values education activities require students to reflect on their own beliefs and behaviour and then share this reflection with others. Some students may not feel comfortable with this and it is therefore important to allow students to only take part in activities that they are comfortable with. Values education can be incorporated in daily activities across the curriculum through role-plays, storytelling and indigenous knowledge.

### **Awareness:**

Assist students to acquire an awareness and sensitivity to the whole-school and community environment.

### **Knowledge:**

Assist students to gain a variety of experiences in and a basic understanding of what is required to create a sustainable whole-schools environment.

### **Values:**

Assist students to develop values and feelings of concern for the environment and motivation for actively participating in creating a sustainable schools and community environment.

### **Skills:**

Assist students develop the skills for identifying, investigating and solving environmental problems.

### **Participation:**

To assist students to be actively involved at all levels in working towards creating a sustainable whole-school environment.

## **Three approaches to Environmental Education**

### **Education ABOUT the environment → Environmental management**

- Provides understanding of how natural environments work.
- Provides understanding of the impact of human activities.
- Develops environmental investigation and thinking skills.

A common mistake in education is the lack of opportunity for the students to use their critical thinking capacities (as shown below):



(Adapted from *Planning and Evaluation of Environmental Education* by Christiane Dorion, 1993.)

## **Education IN the environment → Environmental interpretation**

- Direct contact with the environment. Provides reality, relevance and practical learning to the student.
- Develops aesthetic appreciation.
- Develops skills for data gathering and analysis.
- Fosters environmental awareness and concern.

## **Education FOR the environment → A sustainable environment**

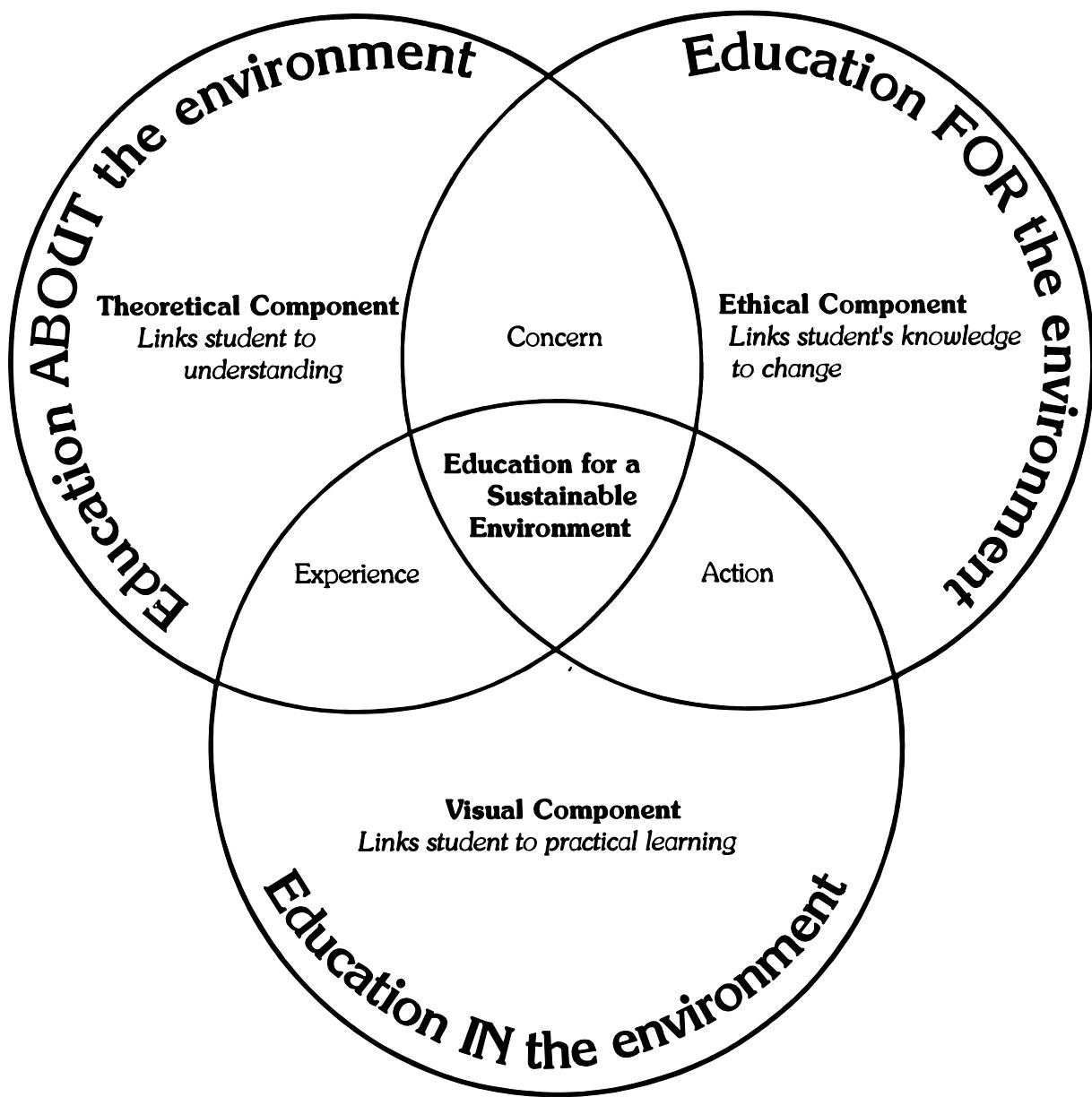
- Links knowledge to change.
- Develops concern and responsibility for the environment.
- Develops environmental ethics.
- Develops the motivation and skills to participate in environmental improvement.
- Promotes a willingness and ability to make lifestyle choices compatible with the wise use of environmental resources.

Student using critical thinking skills (as shown below):



(Adapted from Planning and Evaluation of Environmental Education by Christiane Dorion, 1993.)

## Model for teaching and learning in Environmental Education



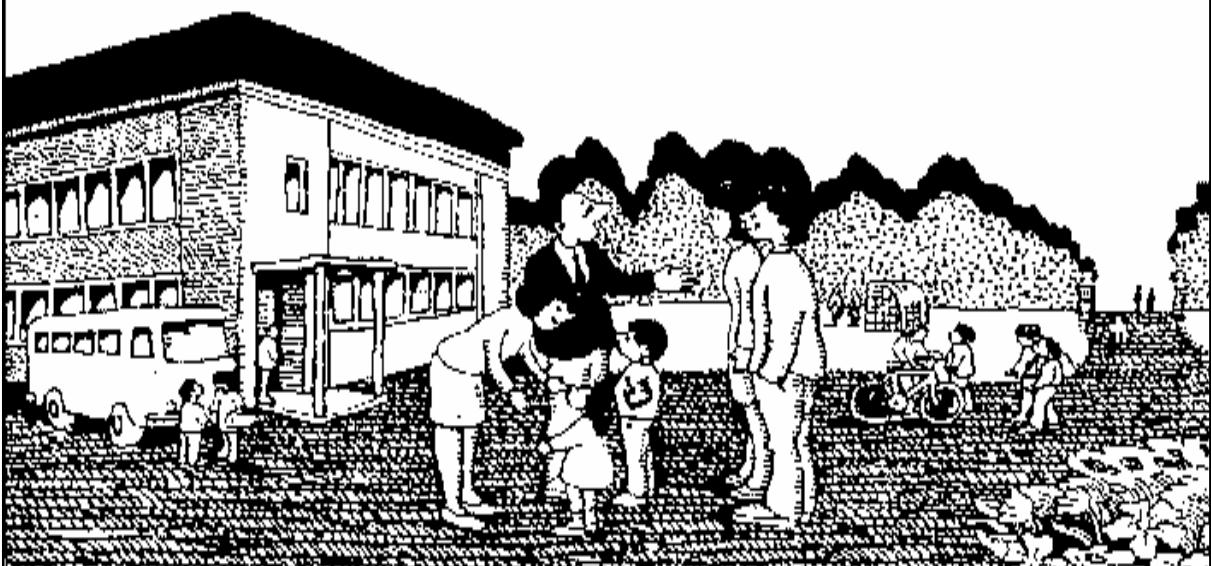
(Adapted from *Environmental Education in the 21st Century* - by Joy A. Palmer, 1998.)

# CREATING A SUSTAINABLE SCHOOL ENVIRONMENT



## **Sustainable School Environment**

1. Waste reduction and recycling
2. Waste management and composting
3. Greening of school grounds
4. Water conservation
5. Energy conservation
6. School Council
7. Aesthetic issues
8. Linking with the community



(Adapted from Planning and Evaluation of Environmental Education by Christiane Dorion, 1993.)

# Establishing an Environmental School Council

In our collected endeavours to create a sustainable school environment the first step could be to establish an Environmental School Council. This will encourage students to participate and claim "ownership" of environmental problems that maybe facing the school.

As equality and democratic decision-making are two fundamentals in a sustainable environment the committee should aim for equality in numbers in the following areas:

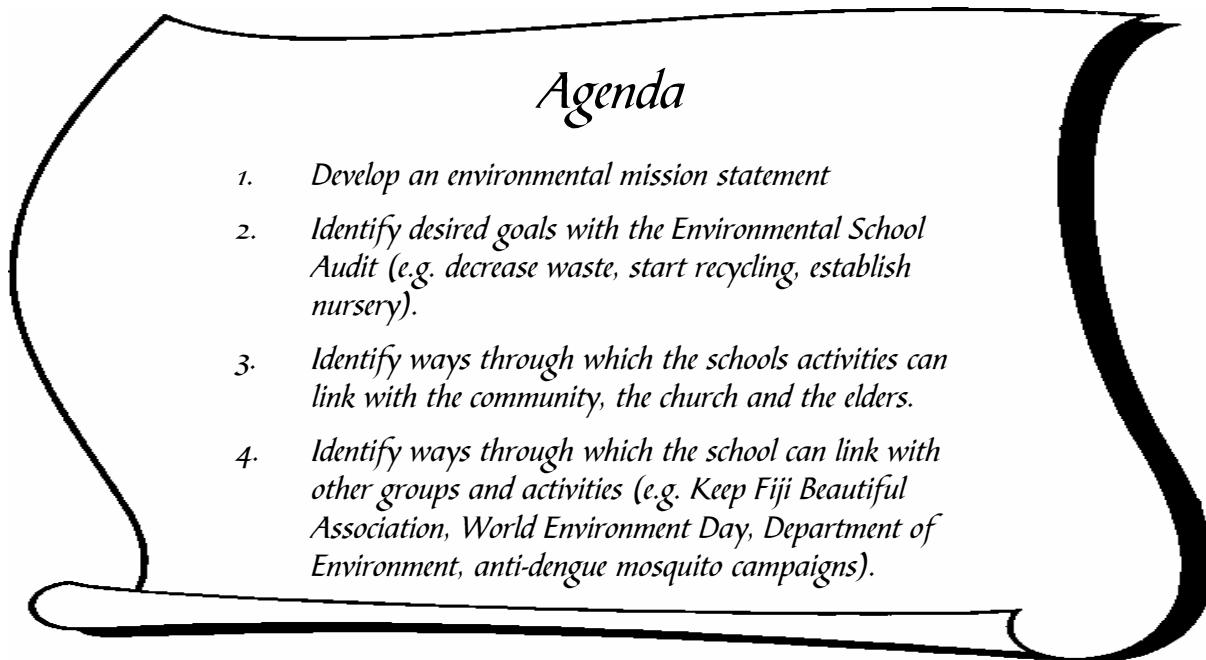
- Teachers and students.
- Women, men, boys and girls.
- Representation of all ethnic groups.

This will contribute to a broad debate and will consider the needs and concerns of everyone.

Students can elect their representative through a class ballot and a representative from each class could be selected. At the first committee meeting a Chairperson should be elected by the committee to oversee and call the meetings.

It is important for the meetings to be focused and have an agenda in order to avoid wasting time.

On the first meeting the agenda could be the following:



In order to make the committee effective it is important to:

- Have regular meetings.
- Have good communication between the committee and the rest of the school and make the committee as inclusive as possible.
- Involve parents in environmental initiatives.
- Ensure all committee members take specific tasks.

# **Environmental School Audit**

## **What is an environmental audit?**

An environmental audit is the process of assessing our attitudes towards the environment.

The environmental audit is done through self-reflection and critical thinking on our actions and our use of resources. During this process we have the opportunity to identify and investigate problems that need to be challenged.

## **What outcomes can be expected?**

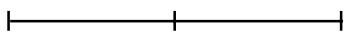
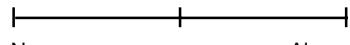
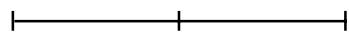
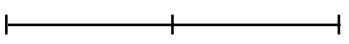
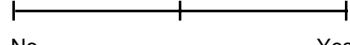
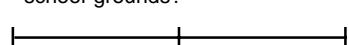
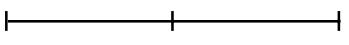
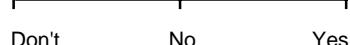
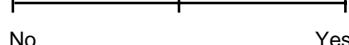
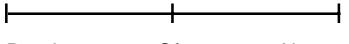
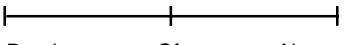
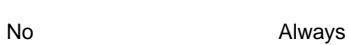
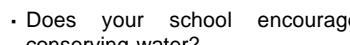
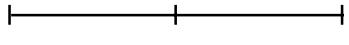
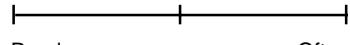
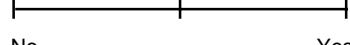
An Environmental School Audit is valuable for the student, teacher and the school. It will assist the teacher and the student to identify problems in the schools environment and more specifically help identify resources used in the school environment.

It provides a first step for the student to investigate solutions to environmental problems such as waste, water and energy conservation.

More importantly, an Environmental School Audit will encourage the students and the teachers to have a good look at their own attitudes towards the school environment and their participation.

In order for an Environmental School Audit to be effective, honesty and openness are two critical factors.

Suggestions for an Environmental School Audit (Teacher's Reflection):

GREEN SCHOOLS FIJI SCHOOL AUDIT		
Organisational principles of the school	Operational practices in the school	Physical school surroundings
<ul style="list-style-type: none"> <li>Does your school have a teacher/student School Council on the Environment?</li> </ul>  <p>No                          Yes</p>	<ul style="list-style-type: none"> <li>Does your school recycle paper, glass and compost food scraps?</li> </ul>  <p>No                          Always</p>	<ul style="list-style-type: none"> <li>Does your school have a diversity of plants and gardens near classrooms?</li> </ul>  <p>Poor                          Good</p>
<ul style="list-style-type: none"> <li>Does your school tap into community resources using elders and environmental groups?</li> </ul>  <p>Never                          Always</p>	<ul style="list-style-type: none"> <li>Does your school have a tree nursery-propagation area?</li> </ul>  <p>No                          Yes</p>	<ul style="list-style-type: none"> <li>Does your school have green school grounds?</li> </ul>  <p>Not green                          Very green</p>
<ul style="list-style-type: none"> <li>Do teachers and administrators communicate with staff from community groups?</li> </ul>  <p>Never                          Often</p>	<ul style="list-style-type: none"> <li>Does your school conduct tree-planting projects?</li> </ul>  <p>Never                          Often</p>	<ul style="list-style-type: none"> <li>Are the school grounds safe?</li> </ul>  <p>No                          Yes</p>
<ul style="list-style-type: none"> <li>Are students involved in and responsible for various tasks in the library, school grounds and office.</li> </ul>  <p>Never                          Often</p>	<ul style="list-style-type: none"> <li>Are staff disposing of paints and chemicals correctly?</li> </ul>  <p>Don't Know                          No                          Yes</p>	<ul style="list-style-type: none"> <li>Are classrooms well ventilated and lit?</li> </ul>  <p>No                          Yes</p>
<ul style="list-style-type: none"> <li>Are students represented on school committees?</li> </ul>  <p>Rarely                          Often                          Always</p>	<ul style="list-style-type: none"> <li>Does your school encourage environmentally friendly means of transport?</li> </ul>  <p>No                          Yes</p>	<ul style="list-style-type: none"> <li>Does your school encourage broken furniture to be repaired?</li> </ul>  <p>No                          Yes</p>
<ul style="list-style-type: none"> <li>Are students involved in establishing and enforcing school rules and policies?</li> </ul>  <p>Rarely                          Often                          Always</p>	<ul style="list-style-type: none"> <li>Does the schools have green staff and class rooms?</li> </ul>  <p>No                          Yes</p>	
<ul style="list-style-type: none"> <li>Do students with disabilities have an opportunity to participate in environmental excursions and events?</li> </ul>  <p>No                          Always</p>	<ul style="list-style-type: none"> <li>Does your school make an effort to conserve energy?</li> </ul>  <p>No                          Always</p>	
<ul style="list-style-type: none"> <li>Does the school have open access for the community to use schools facilities?</li> </ul>  <p>Poor                          Good</p>	<ul style="list-style-type: none"> <li>Does your school encourage conserving water?</li> </ul>  <p>No                          Yes</p>	
	<ul style="list-style-type: none"> <li>Does your school purchase environmentally friendly products?</li> </ul>  <p>Rarely                          Often</p>	
	<ul style="list-style-type: none"> <li>Does your school encourage strong links to the community?</li> </ul>  <p>No                          Yes</p>	

## Activities for conducting an Environmental School Audit

Teachers and students can do an Environmental School Audit suitable for their school environment. Below are two examples on how to conduct activities as a part of an Environmental School Audit:

### **Example 1**

#### ***Plant Survey***

1. Divide a map of your school into areas and assign each area to an action team. Visit each area and identify all species of plants growing there. Use elders in your villages to help you identify plants and add this information to your map.
2. Find out which plants growing in your schools are locally native and which are introduced species. Research the problems associated with introduced species of plants.
3. Identify areas around the school ground that have been cleared or that are lacking in trees and plants. Highlight these areas on your map.
4. Find a creek or waterway near your school. Look to see whether the riverbanks are well vegetated. If you find areas with little or no plant cover, note the effects on the banks and the water.
5. Identify local native plants suitable for your school ground. Consult elders, community groups or nearby nursery for help.

### **Example 2**

#### ***Litter Bin Survey***

How many bins are there on your school ground? Number \_\_\_\_\_

Are the bins full? Yes No

Can rubbish blow out of the bins? Yes No

Are the bins clean? Yes No

Is rubbish around the bin? Yes No

Are more bins needed? (if yes, what actions can you take?) Yes No

Are there any recycling bins available? Yes No

# **Some actions for a sustainable school environment**

## **Energy Conservation**

- Use of skylight.
- Use of alternative resources (wind and sun).

## **Waste Reduction and Recycling**

- Reduce paper use (reuse returnable handouts).
- Reuse paper.
- Collect and recycle paper in every classroom and office.
- Reuse or recycle cardboard boxes.
- Collect and return beverage containers.
- Collect and recycle cans and glass.
- Compost organic waste.
- Reduce plastic consumption.
- Identify recycling possibilities for plastics.
- Salvage reusable materials and supplies.
- Avoid or minimise use of disposable dishes, cups, towels etc.
- Require recycled copy paper, computer paper and envelopes.
- Buy only environmentally friendly products.

## **Water Conservation**

- Use flow restrictors on taps.
- Ensure regular maintenance to prevent leaks.

## **Wildlife Habitat**

- Plant (or maintain) locally indigenous trees and shrubs.
- Put out birdfeeders and nesting boxes.

## **Charitable Fundraising and Contributions**

- Contribute a portion of student-raised funds to worthwhile environmental project or organisations.
- Hold special fundraising events or programs for specific projects.

## **Greening the school grounds**

- Establish a nursery.
- Plant of native trees.

## **Purchasing**

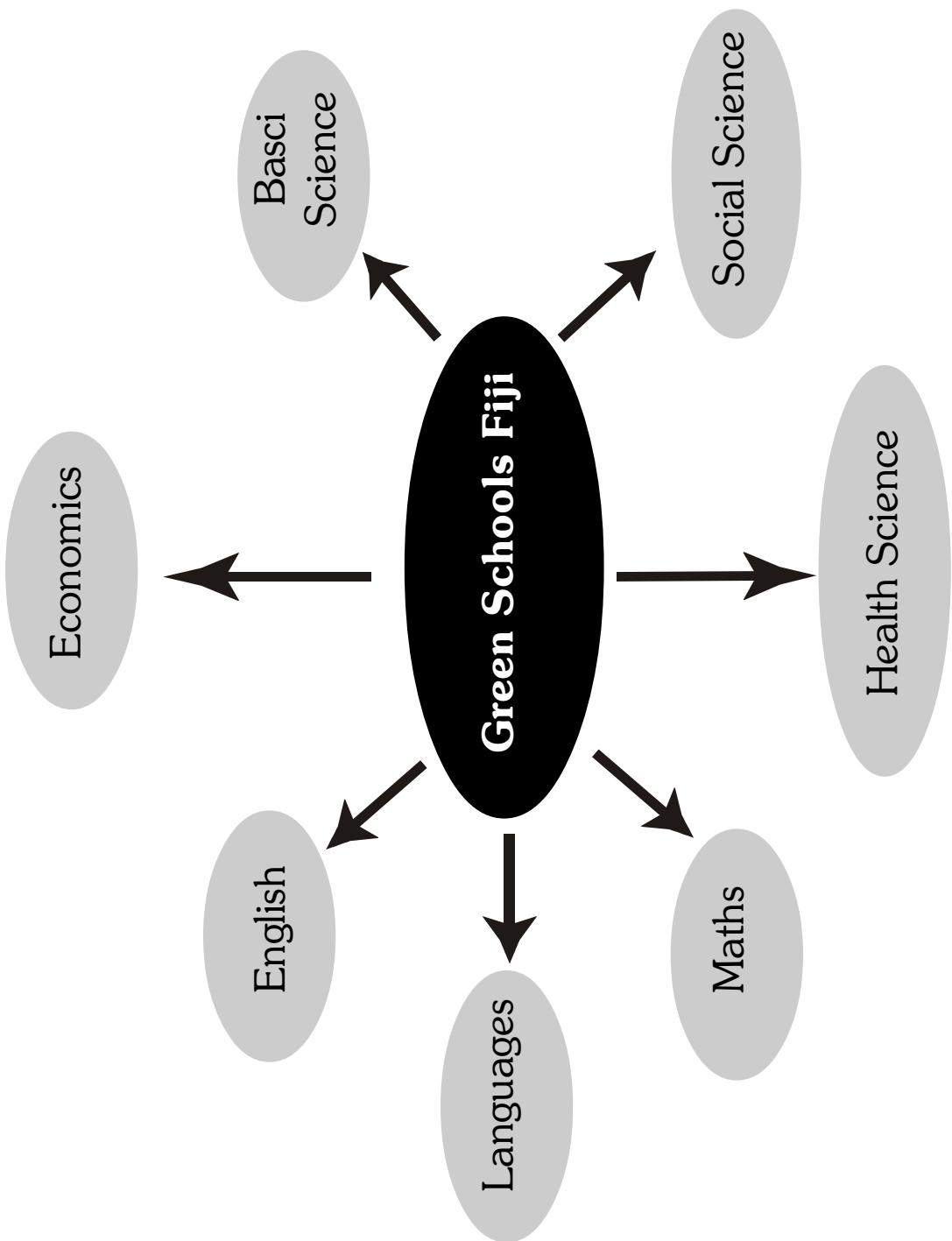
- Avoid purchasing of good with excess packaging.
- Reuse containers and packaging.
- Management of Toxic Materials.
- Ensure proper labelling and storage.

## **Communication**

- Establish a school council where students participate in decision-making.
- Ensure school involvement with the community and action-based environmental education initiatives.
- Develop a mission statement for the environment.

## **Green Schools Fiji and the curriculum**

Ideally environmental education should be integrated across the entire school curriculum, with every subject area at every year level dealing with the environment in some way. Some subjects by their very nature, present greater opportunities for environmental education but all have a role to play.



Here are some ideas for integration of Environmental Education into the curriculum:

<b>Greens Schools Fiji the curriculum</b>	
<b>Subject Area</b>	<b>Suggested Activities</b>
<b>English</b>	<ul style="list-style-type: none"> <li>• Using drama, role-play and problem-solving debates to express attitudes and perspectives on environmental issues.</li> <li>• Enjoying stories, novels, plays and poems from around the world on environmental themes.</li> <li>• Use research and investigative skills to develop English language skills.</li> <li>• Discussing and debating school and community related environmental problems to develop language skills.</li> </ul>
<b>Local Languages</b>	<ul style="list-style-type: none"> <li>• Use local storytelling to strengthen language skills.</li> <li>• Learn about traditional ways of protecting the environment and preventing problems from occurring.</li> </ul>
<b>Maths</b>	<ul style="list-style-type: none"> <li>• Conducting water quality testing.</li> <li>• Examining costs/benefits of energy efficient practices.</li> <li>• Auditing energy use - rating appliances, calculating costs and savings.</li> <li>• Interpreting statistics on environmental trends and developments.</li> </ul>
<b>Economics</b>	<ul style="list-style-type: none"> <li>• Investigating "green" consumerism.</li> <li>• Comparing packaging, eg. paper vs. plastic.</li> <li>• Investigating wants vs. needs (family, individual and school community.)</li> <li>• Assessing operation of local industry in regard to "costs" of pollution.</li> </ul>
<b>Health Science</b>	<ul style="list-style-type: none"> <li>• Implement a waste minimisation and recycling program in the school and investigate the implications of this for human and environmental health.</li> <li>• Investigate the chemicals in the local school water supply. Are they safe? Is there a level at which human health may be effected?</li> <li>• Address a local school problem that may have consequences for human health.</li> </ul>
<b>Basic Science</b>	<ul style="list-style-type: none"> <li>• Establish a nursery propagation area in the school ground and initiate a tree-planting scheme.</li> <li>• Establish school compost.</li> <li>• Investigate the physics of energy production from renewable and non-renewable resources and their environmental impact.</li> <li>• Invite community people to talk about environmental/science issues.</li> </ul>
<b>Social Science</b>	<ul style="list-style-type: none"> <li>• Investigate the various ways in which different societies respond to and value the environment.</li> <li>• Use roleplay/simulation to identify the different interests in an environmental issue.</li> </ul>

	<ul style="list-style-type: none"> <li>Examine the rights and obligations of individuals, businesses and organisations on environmental issues.</li> <li>Implement a recycling programme in the school with the aim to change the behavior of the school community towards waste.</li> </ul>
<b>The Arts</b>	<ul style="list-style-type: none"> <li>Creating a mural in the school ground about the environment.</li> <li>Composing, interpreting and performing music on environmental themes.</li> <li>Appreciating the environment within outdoor activity programme.</li> <li>Drawing and painting to sensitise students to the environment.</li> </ul>
<b>Agriculture studies</b>	<ul style="list-style-type: none"> <li>Implement a comprehensive tree-planting programme on the school ground.</li> <li>Create a small wildlife habitat by planting trees that attract a variety of birds.</li> <li>Investigate issues of farming native animals</li> <li>Create and maintain a school farm, choosing species appropriate to local conditions.</li> </ul>

## Introducing Drama into Teaching with Indigenous Stories

The first step of introducing drama into teaching with indigenous stories is to go through the following drama techniques.

- i) Basic Statues - Bodies can be anything
- ii) Basic Statues - Describing the environment
- iii) Basic Statues - Story telling

## Drama Techniques

These techniques can be used to help young people explore issues about the environment in general or their environment in Fiji.

Statue techniques, described below, can make simple environmental themes new and interesting or create a new way of looking at simple environmental issues.

These techniques are also used in plays to signal the end of a sequence or to create a picture for the audience to look at.

## **Basic Statues - Bodies Can Be Anything**

To start statue work you need to divide the group into pairs. One person is a piece of wood; the other is the sculptor. The person, who is the piece of wood, has to stand completely still and the sculptor shapes them.

***There are two ways to do the shaping:***

- a) The sculptor moves the person they are working with, using their hands to move the body into the position they want to create.
- b) The sculptor does not touch their partner but guides them into position, keeping a few centimetres distance between their hand and their partners' body. The partner responds to the sculptor's hand movements by moving.

The second way of doing statue work requires much more concentration and can be better for groups who do not know each other very well and who find touching too personal or sensitive.

The idea of the statues is to make interesting shapes with the body. Nobody should be uncomfortable, or in a position they cannot hold. For example, you would not expect someone to stand on one leg without falling over! You could, however, give them a chair to put their leg on and achieve the effect of having one leg raised. The statues can show people working or fighting or hunting or fishing. They do not have to have any theme at all, **BUT** they do have to remain completely still!

When the sculptors have made their partner into a shape they are happy with, they should go and sit down. When all the statues are finished, all the sculptors walk round and look at what they have done. You can ask them to talk about what the statues are, as they look round.

When they have finished looking round the process starts again, but this time the sculptors become the piece of wood and they are shaped. The new sculptor sits down when they have finished shaping the wood and then all the sculptors go and look at the statues again.

## **Basic Statues - Describing the Environment**

The next stage is asking a group to make body pictures of important environmental areas or issues through statues.

- Join two or three pairs to make groups of 4 or 6.
- Each group is given a topic e.g.
  - different kinds of trees
  - what is in a forest
  - things made from the forest
  - the reef
  - creatures on the reef
  - how we use the reef
- Or they are all given the same topic
- All the members of the group are involved in the pictures.

- Each group must show their picture to the others, and they must guess what everyone in the picture represents.
- Two or three people or more, can join together to make a piece of reef or a tree.
- Follow up with a discussion about why the forest and the sea are important.

The first time they do this, you may not want to focus on one environmental area then you would only make the body statues in that one area, but just see what they have to show you. Do not be afraid of giving every group the same issue to develop into statues.

Wan Smolbag has done this exercise with several groups from villages and schools where people started off in statues showing trees in a forest e.g. Kauri and then "melted" (or moved slowly and gracefully) into the next picture which was of forest creatures e.g. Flying fox and then "melted" again into a forest use e.g. canoe or someone collecting leaf medicine. After they showed the group the picture there was a discussion about the issues shown in the pictures.

## **Basic Statues - Story Telling**

As we said previously, statue work can be a very useful tool for focussing people on issue areas. Just getting people to name a tree will not make them think very deeply about it but when they have to try and remember its shape by making a body picture with other people it involves much greater thought and discussion.

In this section there are **two techniques** to do this:

### **A) MOVING PICTURES LOOKING AT ENVIRONMENTAL PROCESSES**

In this form of statue work there are a series of pictures that can move to perform an action. We follow the consequences of certain actions on the environment. A large group of as many as 10 people are best for this kind of exercises.

- Give each group the information about an environmental topic or process in order to make the picture e.g.
  - what happens to rivers when we cut down all the trees
  - what happens when we smash the coral on the reef
  - the different things that smash the corals
  - what happens when you remove mangroves

**The topic:**  
**Mangrove Forests are Cleared**



**The first picture:**

This could show people as the mangrove forest, as the trees, as fish and crabs and other creatures in a mangrove system, as the water and people fishing for fish and collecting crabs from the mangrove.



**The second picture:**

This could show one or two people moving through the mangrove and cutting the trees, the people as trees would fall to the ground and be carried off by those cutting. Those as fish would move from mangrove to mangrove as they are cut until there is nowhere else for them to shelter.



**The third picture:**

This could show those as small fish moving out to the deep water because there is nowhere for them to shelter and then being eaten by bigger fish or by birds.



**The final picture:**

This could show the empty water without life. People walking through the water looking for fish and crabs but finding nothing.

*Can you think of some other stories that are relevant to your community?*

- The group must take the topic they are given and make a series of pictures showing what happens.
- When the pictures are presented to the group the audience should explain to the group leader what they have seen.

*Discussion*

- The group leader could then ask how things could be changed:
- like how the harvesting of the mangrove could be done in a way that might still retain the mangrove system or
- how logging could be done in a way that prevents problems like erosion or silting of rivers.

*Can you remake your play?*

- You may want to ask if any other member of the group wants to change any of the pictures they have seen following on from the discussion.

## **B) THERE'S ALWAYS A GOOD AND A BAD SIDE!**

Very often with environmental issues, the aim is to make people think and to start a discussion. Often we are dealing with sensitive issues and people have never really had a chance to think deeply about the issues before. Good and Bad Sides is a very simple exercise using statues, which allows people to look carefully at issues and to see that every thing has two sides!

You will need to divide into groups of 6. You can use bigger numbers, up to 10, if you want to.

Give each group a topic such as:

- Logging
- Reafforestation
- Harvesting Beche-de-mer
- Hotel developments
- Disposing of rubbish in the sea/ on land/ by burning
- Recycling

You should use topics that are relevant to your community.

When you have given out the topics to each group:

- The group must discuss all the good things about the topic they are given and then all the bad things about it.
- Make three 'body pictures', think of it as a set of photographs telling a story which show some of the good things you have discussed
- You do not need to have every person in the group in each picture.

- Make another three 'photographs' showing the bad side of the topic, using the ideas you have discussed.
- Act out your six pictures to the whole group.
- Let them guess what your 'body pictures' are showing.
- Discuss the good and bad sides of each topic. Are the examples you have chosen realistic?
- Does one side outweigh the other?

Once the students are familiar with the drama techniques involved, then they will have all the skills needed to dramatise their stories.

Get each member of the class to find and learn a custom story. This they could do by asking family members or friends, and should be on issues relating to the environment e.g. sea, marine creatures, leaves, trees.

Once each student has a story to tell, then split the class into groups of 5 or 6. Get each member of the group to tell their story to the other members of their group. Once all the stories have been heard, each group then decides which story they will act out.

Each group then turns their chosen story into a series of pictures without words. The group needs to come up with a set of pictures that tell the story. Divide the story into sections or scenes - 1,2,3,4,5.....a set of pictures, depending on the story, so that the most important parts of the story are chosen and long complicated or irrelevant parts of the story left out. Sometimes a story will flow automatically and with not need to freeze between scenes but the end of the play should finish on a freeze. **A freeze is where the actors hold a pose and do not move for some seconds.**

The group has to think of ways of representing the sea, rocks, trees, reefs, plants or fish in the story with the human body.

At the end of each drama the audience should try and re-tell the story they have just seen. Each group takes their turn with the audience trying to re-tell the story they are seeing.

The stories can be used to initiate discussion of environmental themes, such as:

- What is important in the lives of the people in the story?
- Are these things important to people now?

Or simply as an exercise in story telling.

# Teaching with indigenous stories

Stories are found in many different places and take different forms. They are found in books, novels, songs, poetry, dances and theatre and they often emphasise our physical and spiritual relationship. Students' awareness of the environment and our relationship with nature can effectively be communicated through stories of the past.

It is often possible to categorise traditional stories into stories about:

1. The origin of the earth and the formation of natural features;
2. The importance of plants, animals, birds, fish and insects;
3. Ways of farming or fishing sustainably;
4. Ways of caring for special places or species;
5. Ways of caring for other people; and
6. Ways of using resources wisely.

***Indigenous stories should not be used to romanticise the past but merely create an awareness of our dependency on nature that is often taken for granted.***

## The purpose of traditional stories

- Stories safeguard information and belief.
- Stories remind us of other times and different places and help move us beyond our preoccupation with the "here and now".
- Stories have a beginning, middle and an end. They help us see the cycle of events in our lives.
- Stories evoke powerful emotional responses that can help us to clarify the way we feel and can fuel the desire for change.
- Stories always generate communication. Not only does listening to a story create a warm bond between us, once the story is finished we often turn to each other to talk.

## Powerful lessons stories can teach

- We can adopt new values and behaviour models.
- We can adjust our expectations.
- We can learn effective action for the environment is possible.
- We can learn it is in our interest to stop damaging nature.

## Identifying stories suitable for teaching (Teacher Reflection).

Stories about...	Stories and their messages	Relevant school topics or subjects
1. Origin of the earth and natural features.	Story name:  Source:	
2. Importance of living things.	Story name:  Source:	
3. Ways of sustainable farming and fishing.	Story name:  Source:	
4. Ways of caring for special places.	Story name:  Source:	
5. Ways of caring for other people.	Story name:  Source:	
6. Ways of using resources wisely.	Story name:  Source:	

## Telling stories well

### 1. Select a good story.

Select a story that people enjoy and want to tell. Do not choose something because it is simple or short. People enjoy hearing stories that have humour, surprise, suspense, predictability and sharp dialogue that is relevant to the task at hand.

### 2. Take time out.

In order to learn a story well you need time out from other distractions. Set aside sufficient time to concentrate on the key events.

### 3. Give voice to the story.

After reading your story several times, try reading it out loud. You may need to highlight parts that need emphasis eg refrains, openings and closings. Remember storytelling does not mean learning a story word for word. Vary your voice.

### 4. Story structure.

Develop notes on the structure of the story. It is important to only record key words, phrases and sentences.

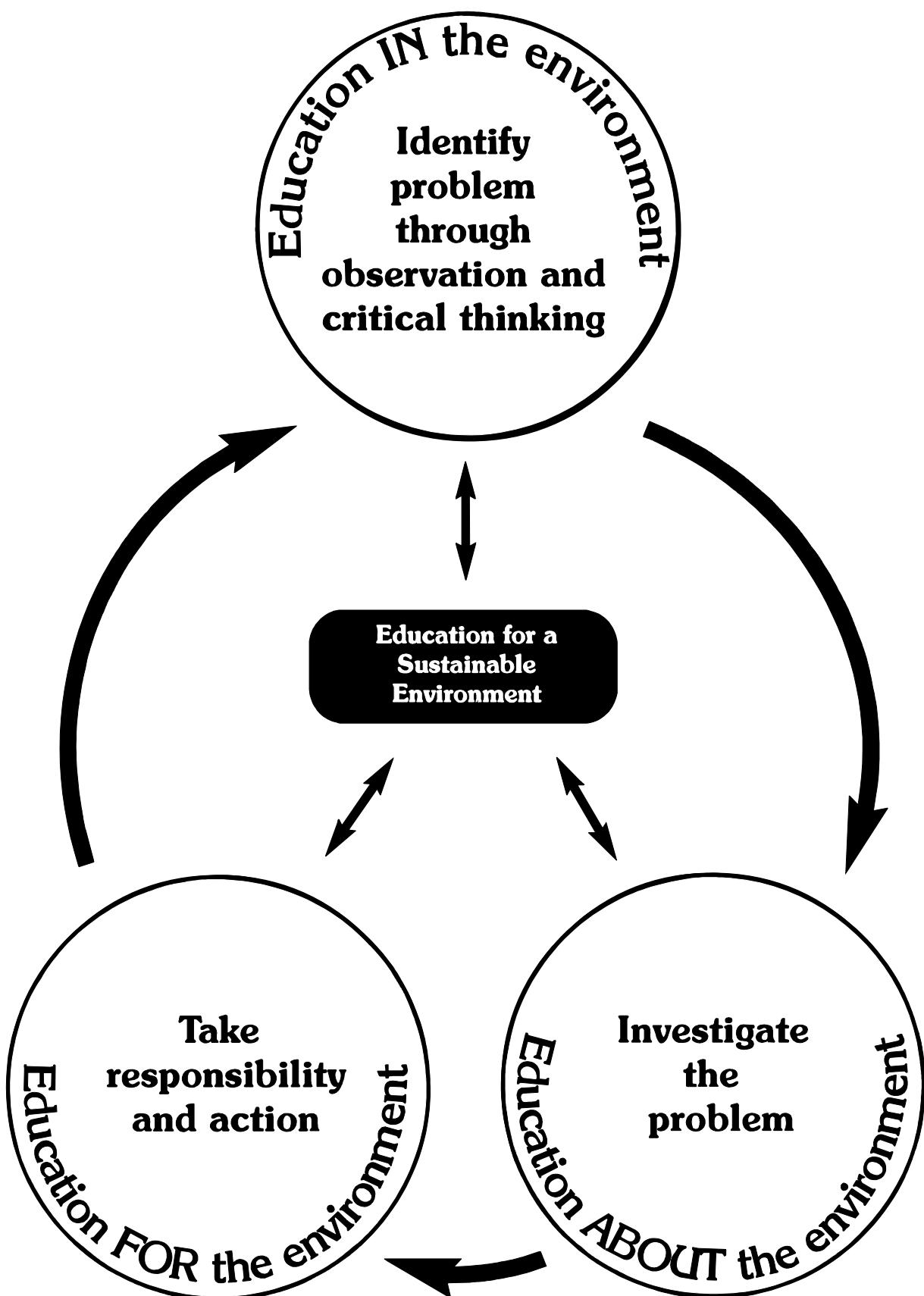
### 5. Memorise

Try to memorize the opening and the closing of the story.

LEARNING TO SOLVE PROBLEMS



## Problem Solving Model



Only education FOR the environment offers teachers the theory and practice that can link knowledge to environmental improvement and this therefore remains an essential component of Environmental Education.

## Problem Solving Model in Practice

To incorporate environmental issues in the schools we need to recognise some basic characteristics of these issues.

- Environmental issues are often complex as they involve economic, social, cultural and political circumstances.
- There are always two sides to an issue and multiple perspectives.
- It takes more than knowledge and facts to understand environmental issues. It requires seeing the problem from different angles and awareness of values and beliefs.
- Taking action and solving environmental problems in Fiji is an ongoing process. As we make positive change we encounter new challenges and access new information.

It is important for the teacher not to influence the students with his or hers own view. Allowing the students to claim ownership of environmental problems is very important and this ensures sustainability and integrity of the learning process. The Problem Solving Model aims to protect this process.

### Component 1: Identifying a problem

Students are asked to identify problems associated with their local school environment.

The task could include:

Environmental Audit of the school environment using the "Green Schools Fiji" targets and using practical processes of learning. During the environmental audit of the school environment issues will present themselves to the students.

#### Important points!

- It is important that the teacher does not select the issues for the students as this often cause students to loose interest.
- The students will often jump straight to the "Take responsibility and action component". It is important that the teacher protects the process and encourages the students to fully understand the problem.

Teachers will know a problem is well-defined and understood when the students can:

- Identify the people and organisations with an interest in it;
- Explain how those people/organisations perceive the problem and what assumptions they have made about it.
- Identify their own interests and concerns about the problem.
- Understand the issue well enough to be able to frame it in several ways based on the different assumptions and perspectives.

## **Component 2: Search for solutions**

Searching for solutions involves understanding alternative views and the range of alternative solutions. It requires time to understand the scope of a problem and to experiment with several solutions. It means encouraging great creativity and then going back to the identification stage to learn more about what the solution might entail. This often happens by giving examples and changing ideas.

### **The teacher may want to consider following:**

1. What skills do students need to address the issue?
2. Do these skills match the curriculum objectives?
3. What level of complexity are the students ready for?
4. How meaningful is the issue to the student?
5. What is the teacher's role - information provider, facilitator, and adviser?

### **The students should be encouraged to:**

- Think critically and creatively about possible alternatives.
- Consider the values of other people and their own.
- Decide a set of options.
- Justify decisions.

Once students identify a range of solutions, teachers can help them consider the constraints and possibilities of each and the values and interest they serve. Here are some questions you can use to direct this process.

1. What are the values and interests served by each solution?
2. What possible outcomes does each solution hold?

3. For each solution, what constraints might stand in the way of the desired outcome?
4. Is the solution win-win or win-lose?
5. Who gains and who might lose from each solution?
6. Do the solutions directly relate to the problem as the student defined it?
7. To which solutions could the class make a meaningful contribution?
8. What resources and time would be required?

Evaluating the options is not always easy and it is important that the teacher take the role of supporting the students. The teachers' question to the students about the chosen options is a useful method of bringing about discussions. The sustainability of the chosen outcomes is also an important aspect the teachers can assist the student with.

### **Component 3: Take responsibility and action**

Taking action has to do with understanding what type of changes are possible to resolve the problem, how the student can contribute to this process. Teachers and students can be involved in the action-taking steps in personal, educational and political ways.

You can increase the students' understanding of the breath of possibilities by using these examples to give some imagery:

- Students can share what they have learned with others.
- Students can make a personal commitment to contribute to a solution.
- Students can help other organizations work towards environmental change by raising money, distribute flyers, put up posters or surveying the community.
- Students can conduct direct action projects in their school or community with assistance from teachers.

The following guidelines are especially useful for teachers involved in community-based action projects:

- Allow the students to own the process as much as possible. Ask them how you can help rather than ask questions such as "Have you considered..." rather than issuing directions.
- As much as possible, let the students facilitate meetings and decisions. Use the action project as an opportunity for them to learn and practice key organising skills.
- Encourage students to consider who might disagree with them and ask these people to speak to them. Listen to their concerns and consider them while solutions are being evaluated.
- Realise that students are not always realistic about time. When they identify a project, help them think through the tasks and responsibilities involved.
- Remember the process is as important as the product. Students with a narrow view of success may have a few disappointments in store. If you give them time to work through the differences of opinion the group efforts will be stronger.

## Case Study: Partnership between schools and the community

### (Sorrell School - Australia)

In 1994, the beach adjacent to Sorrell State School was not an attractive place. The dunes were becoming eroded and the noxious weed, African Boneseed was threatening to inundate the native flora. Litter was also abundant on the beach. The teachers and students of the school asked the local Boat Riders Club for help and together they put forward a "Management Plan" to the Sorrell Council Parks and Wildlife for consideration.

The plan consisted of a strategy to protect the sand dunes from erosion by fencing off the dunes and constructing a walkway to the beach. It also suggested beautifying the toilet area by painting murals on the water tanks, providing more rubbish bins and planting shade trees around the car park. The plan targeted the eradication of African Boneseed and the re-establishment of native plants. Additional plans were also made for the disabled, to establish a picnic and barbecue area, construct a community notice board and organise regular litter clean ups.

The schools, in conjunction with other community groups received \$5500 from the Save the Bush Grant. This money was put towards fencing off the dunes and establishing a walkway, painting the mural, planting trees in the car park, the ongoing removal of Boneseed and building the viewing platform.

The group coordinator said:

The aim of the Park Beach Project is to restore the sand dunes at Park Beach, re-establish the natural vegetation and eradicate the Boneseed. The project offers unique opportunities for students at Sorrell School to learn about the local environment, the problems of environmental degradation and the care, patience and commitment required over a long period of time to rehabilitate degraded land. The project also offers opportunities for the school to co-ordinate resources and community groups to achieve their aims. Management plans were collated and discussed at the school. The children drew up their management plan for the area and this plan was sent to the Sorrell Council, Department of Environment and Land Management.

How does this example make you feel?

Could you think of an issue in your community where your students could get involved?

# The important role of the teacher

What students can learn from a good teacher role model!

## Decision-making Skills

Students need to be able to make appropriate decisions according to each situation. This might include choosing appropriate decision making strategies such as: consensus, majority rule, two-thirds majority or secret ballot.

Following model outline varies options:

HIERARCHY	COOPERATION	AUTONOMY
1. Teacher decides all		
2. Teacher decides some	Teacher and group decide some	
3. Teacher decides some	Teacher and group decide some	Group decides some
4. Teacher decides some		Group decides some
5.	Teacher and group decide some	Group decides some
6.	Teacher and group decide together	
7.		Group decides all

By allowing students to take a leading-participatory role in environmental education they will learn decision making skills and may see the relevance of these skills to their own lives and futures and analyse their personal responsibilities in the schools and in the community.

## Facilitation Skills

Students will observe these skills from their teacher and can begin to build upon them by facilitating discussions in their own groups.

The group facilitator and teacher could use following principles to guide discussions:

**Consideration and acceptance for others**

**Listen and comprehend**

**Express yourself clearly**

**Challenge ideas, not people**

**Provide constructive and specific feedback to others**

# Critical Thinking Skills

The teacher should encourage the students engagement in a critical level of thinking considering both the factual and values components of information. One example is the careful consideration of information and possible bias.

## **Conflict Resolution Skills**

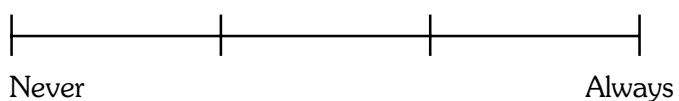
The teacher should encourage the student to develop good communication skills and be very specific in clarifying values and viewpoints. Through good communications skills conflicts and unrest in the group can be dealt with.

Five points for the teacher to consider:

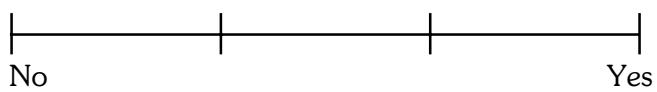
- Sensitive to students' needs. They listen to students' concerns and respect individuality and feelings.
  - Consider students' developmental needs.
  - Create a learning process where students feel a sense of investment, ownership and empowerment. They consider how they can share their authority with the students.
  - Develop a support system of people such as administrators, colleagues, interested parents or community to guide them when teaching controversial issues.
  - Are enthusiastic about the learning process, the projects the students are doing and life in general.

## Teacher self-assessment

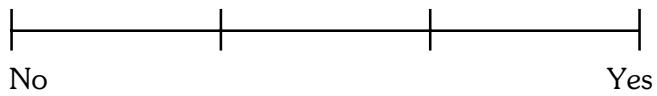
Do you pick up litter from the ground?



Do you compost your foodscraps at home?



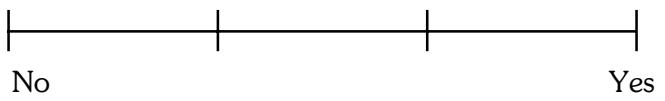
Are you a member of a community-environmental group?



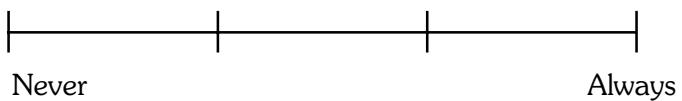
Are you participating in a recycling initiative in your community?



Are you willing to set up a recycling initiative in your community?



Do you buy environmentally friendly products?



## Introducing controversial issues into the classroom

### Balance

When asked how the teacher should approach controversial issues in the classroom many people would stress the importance of presenting students with a balanced picture. That means the teachers need to present the students with a range of alternative viewpoint on each issue. But balance seems a simple concept that on further examination raises a number of difficult questions.

Is it important to have a balanced approach to each lesson or take a balanced approach across the entire unit?

How does the teacher work with the students prejudice towards an issue and how does the teachers consider extra-mural learning from the family and the media in developing the balanced approach to teaching?

#### *Reflection*

What determines which alternatives should be presented to the students to creating a balanced approach to an issue? What is balance?

#### *Statement analysis*

**The teacher presents the student with a wide range of alternative view during discussions.**

##### **Views *for*:**

"The teacher has a social responsibility to show that issues are rarely black and white."

"Necessary when a class has a united view on an issue"

"Important when dealing with issues where there is a lot of conflicting information."

##### **Views *against*:**

"There is no such thing as a balanced range of opinions."

" As a strategy is has limited use."

## **Neutrality**

Teacher neutrality in the classroom requires the teacher to take a role of chairperson and ensure that all students have a say, treating their opinions consistently and feeding in evidence when needed. Neutrality does not imply that the learning process is neutral nor does it imply that the teacher's opinion is value-free. However the teacher should protect the integrity of the learning experience at all costs.

But the teacher should also recognise that situations will arise where the class takes an unquestioning approach to the issue and the teacher may need to play "the devils advocate" and represent a view that the class has not considered in order to ensure the broadness of the debate.

The teacher should keep the following in mind when developing a teaching strategy for controversial issues.

- Educational values such as rationality, imagination, readiness to listen to others and sensitivity must be among the underlying principles in the classroom.
- The teacher must aspire to be neutral.
- Encourage an atmosphere of openness, acceptance and respect.
- Encourage all students to participate and understand a variety of different views.
- 'Balanced teaching' is not possible given external influences from the community such as parents, church and the media. Instead the teacher should ensure that 'balanced learning' can take place through an open and objective debate.

### *Statement Analysis*

**The teacher should remain impartial during controversial discussions.**

**Views *for*:**

"Minimises undue influences of the teachers own bias"

"Gives everyone a chance to take part in a free discussion"

"Gives scope for open ended discussion and the students consider questions that the teacher hasn't thought of"

"Promotes good communications skills"

**Views *against*:**

"Pupils find it artificial"

"Very difficult with less able students"

"May reinforce students prejudices and existing attitudes"

## Indoctrination

Indoctrination is usually associated with attempts to teach something as if it was true or universally acceptable regardless of evidence and facts. When teaching controversial issues in the classroom be honest in your presentation of views, including your own views. When presenting your view be clear to the students that it is your view and that they are allowed to disagree. If students disagree with you or each other allow the disagreement to be constructive not destructive.

Teachers who make their own views clear when teaching about the environment can avoid indoctrinating the students by:

- Ensuring other points of view receive fair and equal treatment.
- Encouraging the students to put forth subject their own views.
- Express own views to challenge students' assumptions.
- Teach multiple perspectives on each topic.

### *Statement analysis*

#### **The teacher should always make known his/her view during discussion**

##### **Views *for*:**

"Students will try to guess what the teacher thinks anyway"

"If students know where the teacher stands on the issue they can discount his or her prejudices and biases"

"It can be an excellent way of maintaining credibility with the students since they do not expect us to be neutral"

##### **Views *against*:**

"It can stifle the issue by inhibiting the students arguing against the teacher"

"It may encourage the students to argue strongly for something they don't believe in simply because it is different/similar to the view of the teacher"

"Students often find it difficult to distinguish facts from values and may see the teachers views as facts"

**Encourage students to accept that changing their mind after evaluating a discussion and considering others views is a sign of maturity. It is not a weakness.**

## Role-plays

Role-plays are an ideal tool for the teacher to use when introducing controversial environmental issues to the students.

- *They can simplify or stimulate complex real-life situations and processes.*
- *Role-plays enable lengthy processes to be studied in a relatively short time frame.*
- *Role-plays emphasise decision making processes rather than abstract knowledge.*
- *Role-plays can develop critical thinking skills for analysing data and evidence.*
- *Role-plays can develop decision making and problem-solving skills.*
- *Role-plays can encourage students to recognise the multiplicity of values and positions on an issue.*
- *Role-plays can help students clarify their own values and attitudes on an issue.*
- *Role-plays can help students empathise with the values and attitudes of other people.*

### Example of a Role-play (suitable for High School students, teachers and tertiary educators)

#### Namosi Copper Mine

Early in 1992 Placer Pacific Limited and Placer Dome Inc. were jointly granted a Special Prospecting License over the Namosi copper/gold prospect through their respective Fiji registered companies, Placer Pacific Namosi Limited and Placer Namosi Limited. Placer Dome funded all workers to the completion of a feasibility study.

Following the granting of the license, a major diamond-drilling program using up to four drilling rigs was completed. The program was designed to better define the high-grade portions of the main East and West Waisoi deposits. It also extended both Waisoi deposits and increased the previous resource estimate.

An economic evaluation is proceeding to investigate the potential of processing up to 100000 tonnes of ore per day. If positive results are gained additional infill drilling and detailed design work could commence soon.

Total expenditure by Placer during 1993 on the Namosi project exceeded six million Fiji dollars.

Should the mine go ahead the Namosi would change dramatically. Two large holes will be filled with 100000 tonnes of rock everyday and copper tailings will be channelled into Beqa Passage. A large road between Navua and the mining site will have to be constructed and traffic in the area will increase and substantial housing developments will be constructed in the area to accommodate the many mine workers and employees.

The educational value of this particular exercise is founded in a process where students critically investigate, evaluate and argue the negative and positive aspects of this development.

Some of the questions to be asked to investigate could be:

What are the benefits?

Who benefits?

Are the impacts of the mine acceptable weighed against the benefits?

Have the impacts been explained to the Namosi villagers?

Who explained them?

What was said about the impacts?

## **Namosi Copper Mine Roles**

### **Group One**

The Minister for Lands, Minerals Resources and Energy who will issue the license.

### **Group Two**

The Namosi Landowners who will reap the benefits through royalties, employment and increased economic activity.

### **Group Three**

SPACHEE who argues that opening the copper mine will bring about an irreversible negative impact on the environment in the country.

### **Group Four**

The Fiji Trades Union Congress who is pushing for the granting of the license as it will generate employment for members.

### **Group Five**

One group of Veivatuloa Villagers who want the license granted, as it will increase their sources of income through the sale of agricultural and marine produce to workers.

### **Group Six**

A second group of Veivatuloa Villagers who do not want the mine as it will damage the environment and their food sources, and also bring undesirable changes to the village.

### **Group Seven**

Placer Pacific, a foreign Mining Company, which is applying for the license. The expected economic life of the mine is 27 years after which time the company will leave Fiji. Its major interest is the financial return to its shareholders.

## Role Cards

### 1. The Minister for Land, Mineral Resources and Energy

You are the Minister responsible for issuing mining licences. Placer Pacific is applying for a licence to mine the Namosi Copper deposit. You know the Namosi Province supports the mine and you need to win their support for the next election. You are also mindful of the harmful effects of the environment. The priority of your government is economic growth and the mine will boost the country's economy.

You are receiving the delegation whose presentations will help you decide whether to issue the licence or not.

### 2. Namosi Landowners

Namosi landowners claim their province has been the most neglected part of the country. There is very little economic development taking place in the country. Since the closing of the banana industry several years back nothing in particular has been introduced to the province except for a few fishponds and beef farming through FDB loans.

The Namosi Copper Mine will accelerate Namosi's economic development and will make Namosi contribute to the achievement of the national economic goals.

You ask the Minister to grant the licence to Placer Pacific without further delays.

### 3. SPACHEE

Use information from enclosed material to present a case opposing the mine and ask the minister not to grant the licence. Tell the minister that there is not enough information available yet to gauge the impact of the mine on the environment. Use this as a delaying tactic and suggest that a time frame of five years will be needed to get all the information. This will kill Placer Pacific's interest and hopefully by then a new government will be elected that might decide against the opening of the Copper Mine.

### 4. One Group of Veivatuloa Villagers

Your group wants the mine opened because of the benefits the mine will bring to your village.

A deep-water dock will be made near your village. A factory that will be used to chemically process the ore will also be built near your village. Employment, electricity, transportation and royalties from the damage done to your fishing ground will help families to build new and better homes and will help improve church and schools facilities.

This is the opportunity you have been waiting for. The Minister should not hesitate to grant the licence. You are not Nationalist but, if the mine is opened, all your people will support the government in the next election. Financially by this time the people will be so well off they can contribute positively to the party campaign.

## **5. Fiji Traders Union Congress**

You tell the Minister of your strong endorsement of Placer Pacific's application for the licence.

Since the industrial unrest in Vautokoula hundreds of skilled miners have lost their jobs. Many have returned home and are having difficulties in adjusting to village life as they spent the majority of their lives in Vautokoula. Their children's education has been badly affected. Ministry of Education and Fijian Affairs have been inundated with calls and applications for scholarships.

If the mine is opened these skilled miners could fit into the operations with ease thus accelerating the initial establishment process. Thousands of other people will also find employment. The mine is expected to be in operation for 27 years.

Ask the Minister to grant the licence to avoid social problems caused by economic hardship and unemployment.

## **6. A second group of Veivatuloa Villagers**

Tell the Minister that if the licence is granted the Minister will be responsible for the death of your people. Who knows, one day the factory might explode and kill all the people in your village. The deep sea docking near your village will scare the fish away or even kill them or make them so poisonous that they cannot be eaten.

You feel the project will introduce negative changes to the village life such as drunkenness, drugs and jealousy as large sums of money flows into the village. Traditional and social fabric will be broken and you are concerned about this change.

Tell the Minister that trouble is already brewing in the village as the other group wants the mine opened. The Roko wants the mine opened as it will help people with their soil. Already there is division in the village even before the first soil is turned.

## **7. Placer Pacific**

Feasibility studies have shown that the Namosi Copper Mine will be of immense economic benefit to the country. Expectations are that the financial return of copper and gold will be 60% more than that of sugar and tourism put together annually, i.e well into the FJD 500 million mark. The life of the mine will continue for 27 years.

As can be seen this mine can see Fiji through into the year 2000 and beyond. It will create jobs for thousands of people.

Social, economic and education benefits will be seen in the wake of the new mine.

Suggest to the Minister that his country will be indebted to him for having the foresight and wisdom to grant the licence.

**The teachers can design their own role-play suitable for their own community and class level.**

# ASSESSMENT OF ENVIRONMENTAL EDUCATION



# Reasons for Assessing Environmental Education

Assessment in environmental education is an all-embracing term. It takes place every day in the classroom and on the school ground through observation, action and exchange of knowledge. Tests and examinations are not always necessary to assess a student's capability, as environmental educators are not only assessing student knowledge but also values and attitudes.

## We assess Environmental Education:

1. *To find out what students know about the environment, what they understand and what they can do.*
2. *To find out what the students do not know, do not understand and cannot do.*
3. *To provide a basis for feedback to students to help them self-reflect, encourage them to develop critical thinking skills and awareness.*
4. *To motivate students and teachers into action.*
5. *To ensure that knowledge about the environment is linked to change and action.*
6. *To improve the environmental curriculum.*
7. *To see whether learning objectives in environmental education are being met.*
8. *To identify environmental learning problems and needs.*
9. *To ensure accountability of environmental educators.*
10. *To predict likely future environmental attitudes and actions of students, teachers and schools.*

**It is important to assess students' attitudes and values in relation to possible improvements to the environment rather than in relation to the values and attitudes of the teacher and other students.**

## How to Assess

**Formative assessment** emphasises the on-going selection of information about the student's learning in environmental education that is then used to make decisions about how to enhance the learning capability of students. Its main purpose is to assist learning and often takes an informal non-judgemental view. It is concerned with what the students can do and helping with what they cannot do in relation to environmental knowledge, enquiry skills and values.

**Summative assessment** occurs at the end of a study and often reflects the final product of environmental learning. It is generally judgemental and ranks the students understanding of environmental knowledge.

**Informal assessment** occurs as an inevitable, integral part of day-to-day classroom activities eg teacher questioning, classroom observation, home and class work. It is often uncontrolled and seeks to be unobtrusive. It is responsive to the needs of students. Benefits for the environment is often at the forefront of the teachers mind.

**Formal assessment** has no direct teaching functions. Its sole function is to provide knowledge about environmental education achievement for someone else. It usually takes the form of tests with predetermined answers.

**Terminal assessment** occurs only at the end of an environmental education programme or at the end of a stage in the programme. It is consequently periodic and final and is often associated with formal examinations.

**Continuous assessment** is intermittent, regular and cumulative. It is often associated with course-work assessment in environmental education.

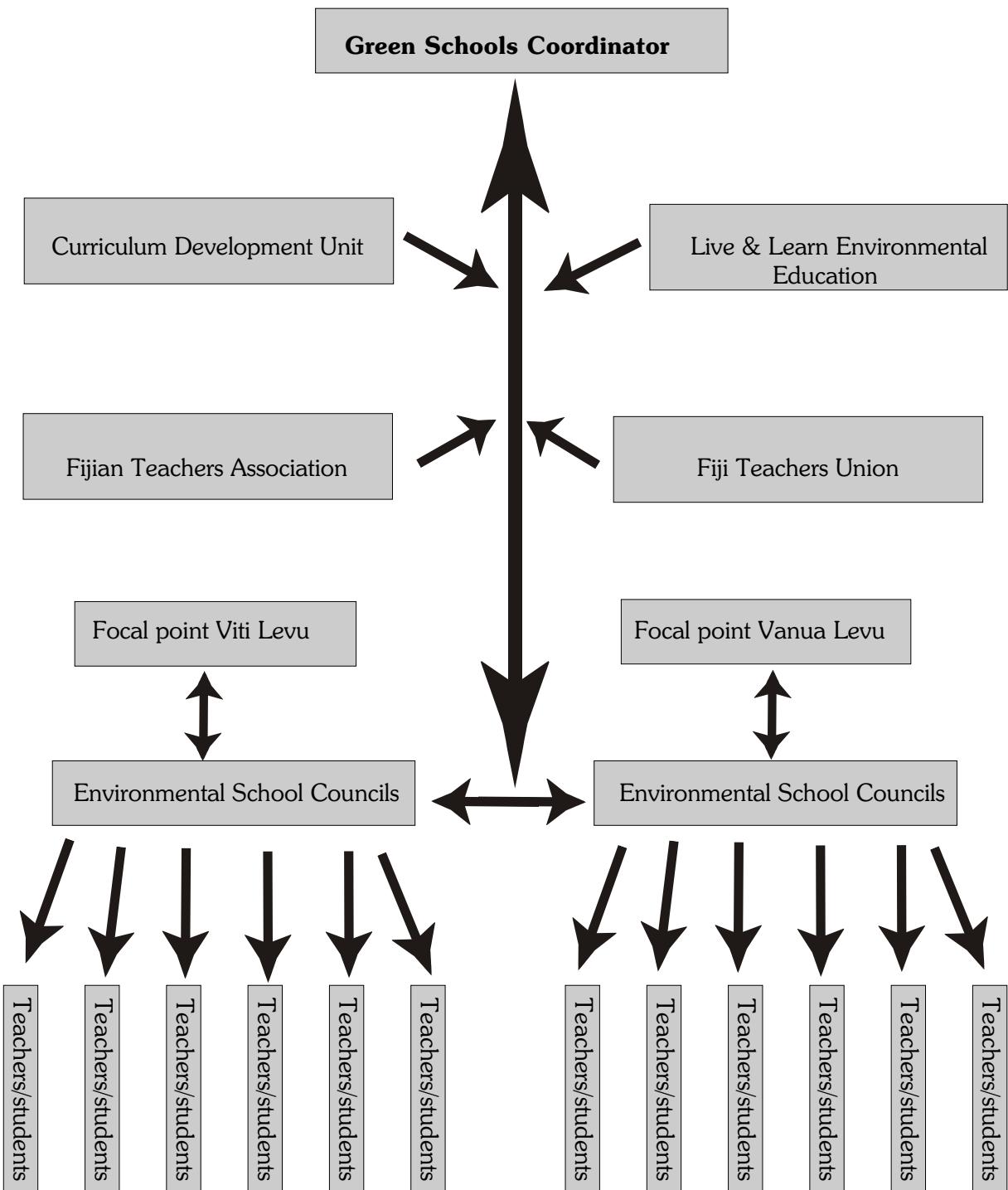
## Methods of Assessing

Method	Examples	Comments
Knowledge	Multiple choice Short answer questions True/false exercise	Wide curriculum possible, risk of overemphasis of facts, can trivialise learning.
Essays	Timed essays Reports Open-book exams	Easy to construct, difficult to mark reliably, good for developing student thinking skills, requires good feedback mechanism.
Projects/enquires	Data from field work	Assess ability to identify, describe, analyse and draw conclusions, emphasises study and information processing skills. Time consuming to mark, good mechanism for feedback required.
Structured questions	Stimulus response	Easy to manage and mark, can trivialise learning and generate routine responses.
Oral assessment	Presentations Debates Discussion groups	Can encourage students to think creatively about the environment but the shy ones might be overwhelmed. Time consuming, can create debate and self-reflection.
Classroom observations	Notes Behaviour	Rich source of evidence of sensitive behaviour towards the environment. Time consuming and hard with large classes.
Self-assessment	Student checklists, diaries, group assessments, can-do-statements, self-reports.	Can be very rewarding for students, difficult to establish as an effective tool, needs practice and time.

# Green Schools Network

The vision for the "Green Schools Fiji" programme is to establish an environmental education network throughout Fiji where students, schools and teachers share ideas on environmental education and change.

## Network structure:



A Green Schools Coordinator will be assigned to maintain the network and support teachers, students and schools in creating a sustainable school environment.

The Green Schools Coordinator will also assess the "Green Schools Fiji" programme on an ongoing basis and encourage teachers, students and schools to link new skills and knowledge to improving the environment in the community.

New experiences will annually be incorporated into the "Green Schools Fiji" manual

## **The Big Picture; transforming attitudes and practices**

Awareness of environmental issues and the need for a sustainable relationship with earth has increased greatly in recent years and continues to grow. Our current action is not enough to counteract the steady deterioration in the quality of the environment.

The main impediment to overcome this environmental destruction is failure to develop sustainable behaviour patterns among the majority of the world's people. What is needed is a fundamental transformation of peoples attitudes and practices. To bring this about will require deliberate and coordinated effort and time. Only a new view and morality can improve our attitudes towards the earth. People's behaviour is a matter of choices based on values. But individuals, groups and societies are often divided within themselves and with others over which values to choose. Education for the Environment is the ethical component in Environmental Education and can help solve such problems. Ethics do not give easy answers but they do encourage people to choose options that serve the best interest for others as well as themselves. Self-reflective education motivates people to make the sacrifices that the hard choices require. In a world of limited resources, conflicting values, and competing individual groups, ethics are the way human beings learn to cooperate with each other and the rest of life for the mutual well-being of all.

This ethical component of Environmental Education is essential for sustainability. It has always been so. Every society that has treated the land and the people well has had an effective conservation ethic. The absence of an adequate ethic of sustainability is a major factor responsible for the failure to meet basic human needs, for growing inequities and loss of freedom in the use and protection of nature, for loss of diversity and integrity of culture and ecosystems, and for the destruction of the capacity of the environment to support future generations. The needs for an ethic of sustainability that helps people cooperate with one another for the survival and wellbeing of all individuals and the environment is crucially important.

Some values that could be included in such an ethic include:

### **People and Nature**

- Respect for Interdependence

To realise that we are totally dependent on natural systems and act accordingly. These acts mean to approach nature with humility, care and compassion and to use both indigenous and scientific knowledge to guide ones actions and behaviour towards sustainability.

- Respect for Biodiversity

Every life form warrants respect and preservation, independent of its worth to people, and the complexity of ecosystems should be safeguarded.

- Living lightly

Everyone should take responsibility for his/her impact on natural systems. They should use natural resources and the environment carefully and in a sustainable manner and restore degraded ecosystems.

## **People and People**

- Respect for basic human needs.

The needs of all individuals and societies should be met, within the constraints imposed by the environment.

- Respect for future generation.

Each generation should leave to the future a world that is at least as diverse and productive as the one they themselves inherited.