



SCHOOLS FOR A HEALTHY ENVIRONMENT OURSELVES

Module 1



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INTRODUCTION

This Module is designed to be used by teachers and facilitators during relevant school and/or Environment Club activities. Each Module provides the curriculum linkages which would help the teachers in choosing activities when planning the lessons during the weekly meetings. Each section of the Module follows the similar format of a seven step inquiry model. The inquiry model is chosen to be followed in the activities because this method focuses on student centred learning. When applying the steps of the inquiry model the teacher will act as a facilitator and the students will:

- gain a deep understanding of the subject matter
- develop thinking and reasoning skills
- develop problem-solving skills
- have their intellect challenged
- take greater responsibility for their own learning
- understand the relationship between what they are studying and the real world
- have varied and interesting learning experiences

The seven steps used in the Inquiry Model are as follows:

1. Tuning In
2. Deciding Directions
3. Finding Out
4. Sorting Out
5. Drawing Conclusions
6. Considering, Planning and Taking Action
7. Evaluation and Reflection

Each of the 6 Modules has been designed with subheadings for purpose, time, materials required and procedure. These subheadings have been included to guide teachers to plan and conduct the activities. The times provided with each activity are suggested times to help the teachers plan the class. This is a guide only; some activities may take less or more time. The inquiry process is based on developing critical thinking and problem solving skills, so the duration of activities should be related to the interest and development of the student's knowledge and skills. Each Module has also been designed with Student Resource Sheets and Teacher Information Sheets for each section, to assist in preparing for and conducting activities. Sample Student Resource Sheets have also been provided to guide teachers as to the kind of responses expected on each Sheet. Once again, this is offered as a guide and responses should not be limited to the suggested ones. Each Module has been written in plain English, however for some subjects it has been necessary to include more technical terms. A glossary has been included at the end of the Modules to explain these technical terms. Where possible photos and illustrations have also been included in each Module to explain or demonstrate specific activities.

These Modules are also accompanied by 2 toolboxes; one for indoor equipment and one for outdoor equipment. The toolboxes provide the physical materials needed to conduct the activities with the required materials being specified for each activity. The toolboxes also contain reference materials, posters and Flip Charts providing the necessary background for these Modules. The contents of the toolboxes and instructions for care and maintenance are included in the following pages.

OVERVIEW OF THE MODULES

There are 6 teaching and learning Modules in this series that are linked to themes in the Environmental Studies curriculum. Each Module provides instructions for a number of activities that might be used with a class to explore aspects of the issue that is being addressed. These Modules do not comprise a complete unit; rather they may be used to supplement other work being done within a topic area and what is found in the established syllabus.



Module 1: Ourselves

1. Island Environment
2. Traditional Knowledge
3. Environmental Impact Assessment
4. Common Diseases and Prevention



Module 4: Resources from the Environment

1. Energy used at School and at Home
2. Conservation, Management and Reuse of Water
3. Managing Waste
4. Reduce, Reuse, Recycle
5. Composting Waste



Module 2: Earth

1. Weather
2. Safe Drinking Water
3. Water Quality Monitoring



Module 5: Interdependence

1. Food Web
2. Exploring my Atoll
3. Ecological Footprints



Module 3: Life Around Us

1. Mangroves
2. Beaches
3. Coral Reefs
4. School Gardens



Module 6: Science and Technology

1. Wind Energy
2. Solar Energy

ENVIRONMENTAL STUDIES CURRICULUM LINKS

	MODULE	SECTIONS	Grades 1 - 3	Grade 4 - 5	Number of lessons
1	OURSELVES	Island Environment		x	3 - 4 lessons
		Living by Traditional Knowledge		x	3 - 4 lessons
		Environmental Impact Assessment		x	4 - 6 lessons
		Common Diseases and Prevention	x		4 - 6 lessons
2	EARTH	Weather	x		4 - 6 lessons
		Safeguarding Drinking Water		x	4 - 6 lessons
		Water Quality Monitoring		x	4 - 6 lessons
3	LIFE AROUND US	Mangroves		x	4 - 6 lessons
		Coral Reefs		x	4 - 6 lessons
		Beaches		x	4 - 6 lessons
		School Gardens	x		3 - 4 lessons
4	RESOURCES FROM THE ENVIRONMENT	Energy used at Home and School	x		4 - 6 lessons
		Conservation, Management and Reuse of Water	x		4 - 6 lessons
		Managing Waste	x		4 - 6 lessons
		Reduce, Reuse, Recycle	x		4 - 6 lessons
		Composting Waste		x	3 - 4 lessons
5	INTERDEPENDENCE	Food Web		x	3 - 4 lessons
		Exploring My Atoll	x		3 - 4 lessons
		Ecological Footprints		x	4 - 6 lessons
6	SCIENCE AND TECHNOLOGY	Wind Energy	x		4 - 6 lessons
		Solar Energy		x	4 - 6 lessons

TOOLBOX CONTENTS

DRY KIT		
	Item	Details
1	Plastic vials/jars screw top	100-300ml.
2	Hand lenses	Magnification x 3, lens diameter 90mm, plastic handle.
3	Long handled tongs	Jaws corrugated inside, length 150x200mm, stainless steel.
4	Insect catching nets	Hand net for insects, overall length 1.48m, diameter 250mm.
5	Plankton nets	Plankton net, nylon monofilament netting, with tough nylon collar, diameter 300mm, overall length 900mm, brass frame with 7m tow line and a PVC filter, aperture size 0.1mm and 0.3mm.
6	Thermometers	Mercury in glass, permanent amber markings, with anti-roll clip, range -10 to 110o Celsius, 6mm diameter with reinforced bulb, in plastic case.
7	Globe of earth	Rubber ball - globe of the earth, fully numbered meridian ring, diameter of globe 30 cm.
8	Twine	Brightly coloured nylon twine (20m).
9	Measuring tape	Sturdy, length 50m.
10	Measuring tape	Length 1 meter.
11	Student microscope	Monocular head rotates 360 degrees and has a 10x eyepiece. DIN 4x, 10x and 40x glass achromatic optics on the triple nosepiece.
12	Binoculars	Magnification 7x50, waterproof.
13	Litmus paper	Red and blue.
14	pH strips	Full Range pH from 1 to 14, colour reference chart with clearly printed pH values and instruction leaflet.
15	Low cost water monitoring kit	Provides simple and non-hazardous method of testing 8 basic water quality parameters: coliform bacteria, dissolved oxygen, BOD, Nitrate, pH, Phosphate, Temperature and Turbidity.
16	Water quality - H ₂ S	Bottle with hydrogen sulphide strip (H ₂ S water test kit).
17	Compass	90 mm in diameter and 22 mm high, and graduated in easy-to-read increments, waterproof.
18	Measuring staff	Metre pole sections in red and white.
19	Jars with screw top lids	500ml with wide lid.
20	Measuring containers	Clear plastic, capacity 1000ml, show divisions every 10ml.
21	Torch	Solar, kinetic, magnetic LED, waterproof.
22	Gloves	Cloth gloves (10 small and 10 medium).
23	Safety spectacles	Clear frames, should be able to wear over prescription spectacles.
24	Sediment sorting trays (3 sizes)	Diameter or length up to 30, Plastic sieve, aperture size 0.1mm, 0.3mm and 0.5mm.
25	Stopwatch	0.1sec, 30sec, 15min dials, diameter 45mm, housed in a plastic case, water proof.
26	Garden fork	Children's garden fork with plastic handle.
27	Garden spade	Children's garden spade with plastic handle.
28	Solar cell educational kit	Comprises of Solar cell module, solar energy introductory booklet; Small DC motor, screws and nuts, wire with motor clips; colour spinner discs; paper aero plane and bird models; plastic turnables with 4 sizes, 5/82, 1.52, and 22; plastic fan spinner.
29	Weather kit	Australian Geographic Weather Watch kit, comprises of rain gauge, thermometer, wind speed indicator flap and measuring cylinder. (www.australiangeographic.com.au)
30	Coral watch kit	Coral watch reef education package, The University of Queensland, Brisbane, Australia.
31	Cubic metre set and corner inserts.	A set of three alternately coloured dm triangle metre sticks, nine blank triangle metre sticks and eight corner blocks for the construction of an accurate internal dimension cubic metre.
32	Spring balance	Spring scale, calibrated in grams (to weigh up to 50kg).

DRY KIT		
	Item	Details
Identifications Guides:		
1	Plastic cards	Plastic card set containing pictures and names of fish and other invertebrates.
2	Field Guide	Field guide to Maldivian Birds & Beach Ecosystems (2008).
3	Field Guide	Field guide to Maldivian Plants (2008).
4	Field Guide	Field guide to Maldivian Mangroves (2008).
Flip Charts:		
1	Weather, Water, Waste and Energy	Weather, Water, Waste and Energy Flip Chart (2008).
2	Environment and Biodiversity	Environment and Biodiversity Flip Chart (2008).
Reference Books:		
	Subject	Author, year of publication, title, publisher and ISBN
1	Biodiversity	Krys Kazmierczak (2000) <i>A field guide to the Birds of India, Sri Lanka, Pakistan, Nepal, Bhutan, Bangladesh and Maldives</i> , Gopsons Papers Ltd, ISBN 81-87107-04-9
2	Biodiversity	Dr. R.C. Anderson, <i>Living Reefs of the Maldives</i> , Novelty Publishers, ISBN 99915-801-1-5
3	Biodiversity	Dr. R. Charles Anderson, (2005), <i>Reef fishes of the Maldives</i> Manta Marine Pvt. Ltd, ISBN 99915-5401-7
4	Biodiversity	National Centre for Linguistic and Historical Research, (2002), <i>Gasgahaagehi</i> , ISBN 99915-1-016-8
5	Biodiversity	National Centre for Linguistic and Historical Research, (2001), <i>Dhivehi raajjeygai hedhey baeh meyvaa</i> , ISBN 99915-1-009-5
6	Biodiversity	National Centre for Linguistic and Historical Research,(2002), <i>Maamelaameli</i> , ISBN 99915-1-025-7
7	Traditional Knowledge	National Centre for Linguistic and Historical Research, (2004), <i>Dhivehi Raajjeyga Huri Aasaaree Thanthan</i> , 99915-1-063-X
8	Traditional Knowledge	National Centre for Linguistic and Historical Research, (2002), <i>National Museum</i> , ISBN 99915-1-016-8
9	Traditional Knowledge	Naseema Mohamed and P.Ragupathy (2005) <i>Inscriptions of Maldives No 1</i> , National Centre for Linguistic and Historical Research, ISBN 99915-1-069-9
10	Traditional Knowledge	Naseema Mohamed, (2006), <i>Essays on early Maldives</i> , National Centre for Linguistic and Historical Research, ISBN 99915-1-083-4
11	Traditional Knowledge	Dr.Philos Egil Mikkelsen, (2000), <i>Archeological excavations of a Monastery at Kaashidhoo</i> , National Centre for Linguistic and Historical Research, ISBN 99915-1-013-3
12	Traditional Knowledge	National Linguistic and Historical Research, (2006), <i>Vihivana garunuge thereyga Dhivehi Raajje 1</i> , Novelty press, ISBN 99915-1-061-3
13	Traditional Knowledge	National Centre for Linguistic and Historical Research, (2006), <i>Vihivana garunuge thereyga Dhivehi Raajje 2</i> , Novelty press, ISBN 99915-1-084-2
14	Traditional Knowledge	National Centre for Linguistic and Historical Research,(2006), <i>Vihivana garunuge thereyga Dhivehi Raajje 3</i> , Novelty press, ISBN 99915-1-085-0
15	Traditional Knowledge	National Centre for Linguistic and Historical Research , (2006), <i>Vihivana garunuge thereyga Dhivehi Raajje 4</i> , Novelty press, ISBN 99915-1-069-6
CD:		
1	Hygiene and sanitation	UNICEF hygiene and sanitation TV advertisement clips
2	Biodiversity	Coral Watch Reef Education CD, in the Coral Reef Education Package (see above)

WET KIT

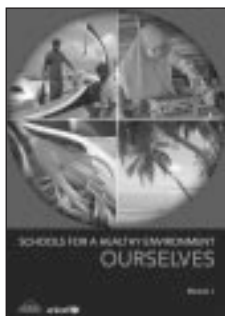
	Item	Details
1	Snorkel	Colourful, snorkelling - Ordinary
2	Masks	Colourful, snorkelling - Small 8 , Medium 12
3	Booties	Colourful, snorkelling - Small 5 , Medium 10, Large 5
4	Footwear / Gumboots	Rubber footwear, gumboots
5	Kick boards	Swimming boards for children (ages 6-13)



OPERATION AND MAINTENANCE OF TOOLBOXES:

- Toolbox Log – each time someone takes any equipment from the toolbox they should sign for which pieces they are using and sign again when they return them. An equipment log will be kept in each toolbox.
- Paper materials – it is important that books, posters, Flip Charts and pictures be kept in a dry place that is well aerated and free from insects. If these materials do get wet it is important to dry them immediately and not to put wet items back with the dry items.
- Outdoor equipment – if any equipment is used outdoors it is very important to ensure that it is clean and dry before it is put away. It is important to store this equipment in a dry, well aerated area that is free from insect or animal damage.
- Wet equipment – some equipment such as masks, snorkels, booties, etc are made for using in the ocean, but if you don't rinse them in fresh water after each use they will quickly become damaged. It is important to store this equipment in a dry, well aerated area that is free from insect or animal damage.
- Specialist equipment – some items don't just need care in storage they need skill in setting them up for correct use. Binoculars for example need to be calibrated for use – different people may need it adjusted for their eyesight.
- Damage – if items are damaged beyond use it may be possible to get replacement items from your local Teacher Resource Centre. They only have limited replacement items so keep your toolboxes in good order.

MODULE SUMMARY



This Module has been developed to complement the theme ‘Ourselves’ in the Environmental Studies curriculum. The Module mainly focuses on teaching students about themselves and how to look after themselves in terms of health, diet and exercise. It focuses on people and society. It involves the interpretation and explanation of the significant issues, events and patterns of change in people’s life, the biological and social influences, the development of individuals and families. It also includes the significance of food and the study of health and their relationship between people and the environment. It examines the interaction of people and change over time across space. It develops an understanding of special context, enabling students to describe and explain the location, pattern and processes associated with natural, cultural and human-made phenomena.

The table below depicts the toolbox contents needed for the practical application of this Module.

Item	Details	Section
Flip Charts:		
Environment and Biodiversity Flip Chart (2008)	General Environment and Biodiversity	1 and 2
Reference Books:		
Traditional Knowledge	National Center for Linguistics and Historical Research (2004) Dhivehii raajeyge Huri Aasaaree Thanthan	2
Traditional Knowledge	National Center for Linguistics and Historical Research (2002) National Museum	2
Traditional Knowledge	Naseema Mohamed and P.Ragupathy (2005) Inscriptions of Maldives No 1, National Center for Linguistics and Historical Research	2
Traditional Knowledge	Naseema Mohamed (2006) Essays on early Maldives, National Center for Linguistics and Historical Research	2
Traditional Knowledge	Dr. Philos Egil Mikkelsen (2000) Archeological excavations of a Monastery at 7. Kaashodoo, National Center for Linguistics and Historical Research	2
Traditional Knowledge	National Center for Linguistics and Historical Research (2006) Vihivana garunuge thereyga Dhivehi Raaje 1, Novelty press	2
Traditional Knowledge	National Center for Linguistics and Historical Research (2006) Vihivana garunuge thereyga Dhivehi Raaje 2, Novelty press	2
Traditional Knowledge	National Center for Linguistics and Historical Research (2006) Vihivana garunuge thereyga Dhivehi Raaje 3, Novelty press	2
Traditional Knowledge	National Center for Linguistics and Historical Research (2006) Vihivana garunuge thereyga Dhivehi Raaje 4, Novelty press	2
CD:		
Hygiene and sanitation	UNICEF hygiene and sanitation TV advertisement clips	4

1

ISLAND ENVIRONMENT

Grades: 4 to 5

Number of lessons: 3 to 4 lessons

Purpose

The purpose of this Module is to introduce the environment as a concept and to provide an overarching framework for the other Modules.

Key questions

Key focus questions for this section are:

- What is the environment?
- Why is the environment important for humans?
- Why is the environment important in the Maldives?

Links with other Modules

This section links to all Modules.

Toolbox

Flip Charts

Environment and Biodiversity Flip Chart

Preparation

You will need the Environment and Biodiversity Flip Chart for the beginning of this section of the Module. Also read Teacher Information Sheet 1.1 to familiarise yourself with the importance of the environment and the environment in the Maldives.

1.1 TUNING IN

The following activities help to engage and focus students' interest on the topic.

ACTIVITY 1: GOOD AND BAD ENVIRONMENTAL PRACTICES

Purpose: To identify good and bad environmental practices.

Time: Approx. 20 minutes

Materials Required: Environment and Biodiversity Flip Chart

Resource/ Information Sheets: N/A

Procedure

Show students the Flip Chart page “Bad Environmental Practices”.

Ask the students to discuss:

- What do you feel when you see this picture?
- Would you like to live in this environment? Why?
- Can you identify some bad practices?
- What do you see that is similar to your island?
- What bad practices could you reduce in your community? How?



Bad Environmental Practices.

Show students the Flip Chart page “Good Environment Practices”.

Ask the students to discuss:

- What do you feel when you see this picture?
- Would you like to live in this environment? Why?
- Can you identify some good practices?
- What do you see here that is similar to your island?
- Do you think islands were better or worse in the past? Why?
- What good practices could you promote and introduce to your community?



Good Environmental Practices.

1.2 DECIDING DIRECTIONS

The following activities will assist students to decide on the directions they wish to take in their research.

ACTIVITY 2: ISLAND MAPPING

Purpose: To identify and locate places of environmental significance on the island by utilizing mapping skills

Time: Approx. 20 minutes

Materials Required: Kitchen paper and markers

Resource/ Information Sheets: 1.1 Student Resource Sheet - Island mapping prompt cards

1.2 Teacher Information Sheet - Resource Mapping and Ranking

Procedure

Divide the participants into three groups. Place the kitchen paper, in a suitable location for all people to see it and be able to place information on it. Ask the students to draw the outline of their island. Start the process by getting more detail

on the map – ask about the location of houses, school, mosques, medical centre, etc. Then get the participants to each place their house on the map.

Provide each group with *Student Resource Sheet 1.1* and some markers (a different colour for each group). There will be task cards for 3 different themes:

- i. Environment, health and sanitation.
- ii. Environment and making a livelihood
- iii. Environment and culture and religion.

Each task card will have questions / ideas for places or events to mark on the map. Ask each group to discuss these and to draw them on the map – they may use a map ‘legend’ if necessary. Allow 20 minutes for mapping.



Island mapping exercise.

1.3 FINDING OUT

The following activities involve students in shared experiences that provide new information about the topic and stimulate curiosity.

ACTIVITY 3: MAP PRESENTATION

Purpose: To present, share and identify information on environmental issues from island maps.

Time: Approx. 20 minutes

Materials Required: Completed maps from Activity 2.

Resource/ Information Sheets: N/A

Procedure

When the map is complete ask each group to explain what they have drawn on the map to the other students. Ask if anyone would like to add or change anything to the map after each presentation. Place all 3 maps on the board. Based on the maps, ask each group to identify the main environmental issues on your island. Ask one student to write down this list on the board for everyone to see.

1.4 SORTING OUT

Students at this stage will be collating, processing, analyzing and presenting the information in a variety of ways. Students will have the opportunity to further explore any questions that may have arisen when they were investigating. This would also be a good time to revisit some of the initial activities from Tuning In or Deciding Directions sections, for the students to witness how their knowledge has increased.

ACTIVITY 4: RANKING ISSUES

Purpose: To identify, order and sequence issues of concern on the island.

Time: Approx. 20 minutes

Materials Required: Blank strips of paper (3 sets / 15 in each set)

Resource/ Information Sheets: N/A

Procedure

Ask the participants to go back to their groups. Ask each group to select 5 issues that are the most serious on their island. Write these issues on the strips of paper. Then ask each group to rank the issues (put them in order) from most to least important according to their opinion. Ask each group to explain why they chose each issue.

1.5 DRAWING CONCLUSIONS

The following activities will help students to interpret information, establish connections and confirm/reject or modify predictions.

ACTIVITY 5: RANKING DISCUSSION

Purpose: To draw conclusions about serious environmental issues on the island.

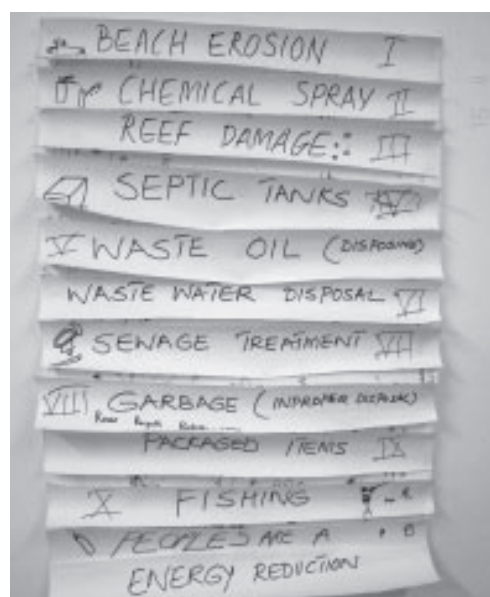
Time: Approx. 20 minutes

Materials Required: A4 paper, staples and stapler

Resource/ Information Sheets: N/A

When the groups have completed the task (and have reached a consensus) ask them to present their ranking to the other groups. They must also explain why they ranked the issues in that way.

Allow the other groups the opportunity to ask questions to the group presenting their ranking. Then allow each group to reconsider their own ranking. The activity concludes when all groups have presented their rankings and have had time to discuss and reconsider their rankings based on the dialogue. Ask each group to staple their final rankings onto a piece of A4 paper and collect them for future records.



Ranking environmental issues.

1.6 CONSIDERING, PLANNING AND TAKING ACTION

As a result of students being actively involved in decision-making throughout the inquiry process, it is hoped that they will be empowered to take action which has positive personal, community and global effects.

ACTIVITY 6: TAKING ACTION ON MY ISLAND

Purpose: To consider, plan and take action on environmental issues on the island.

Time: Minimum 30 minutes

Materials Required: Pens, paper, markers

Resource/ Information Sheets: N/A

Procedure

Discuss with students ways to raise awareness on this subject in your community. Some suggestions for taking action on your island include:

- Write to the island authorities about the main environmental issues on your island.
- Draw a set of posters showing the environmental issues for display at school or around your island.
- Organise an environmental awareness day and invite parents/other people to come and discuss about the environmental issues on your island.
- Write a story or play about the changes on your island and how we can act to solve the problem.
- A display might be made of the posters, and a concert held featuring stories and songs and the student's plays and stories.

1.7 EVALUATION AND REFLECTION

At this stage it may become evident that there is a need to return to some stages of the inquiry process to clarify knowledge or refine skills.

The following questions may be asked:

- Are you happy with the ways in which your information was gathered, analysed and presented?
- Is there anything you would change?
- Are there things you need to investigate further?

ACTIVITY 7: LESSONS LEARNT

Purpose: To reflect upon what the students have learnt.

Time: 15 minutes

Materials Required: Pen and paper

Resource/ Information Sheets: N/A

Procedure

Ask students to write down:

- Four important ideas/concepts/information/values I have learnt in this Module are
- Two things I now want to do for myself and for others are.....

Ask students to decide what they would like to do with the results of their research and discussion.

ACTIVITY 8: HOW DO YOU SEE THE ENVIRONMENT?

Purpose: To identify and reflect upon student's environmental perceptions.

Time: 15 minutes

Materials Required: N/A

Resource/ Information Sheets: 1.2 Student Resource Sheet - Environmental perceptions

Procedure

Place the *Student Resource Sheet 1.2* posters in separate locations around the room. Explain to students that there are many different ways of perceiving and valuing the environment. Introduce each poster and explain what it means (with examples). Allow the participants to ask questions about the posters.

Ask each participant to think about which environmental poster best describes the way that they feel about the environment. Allow them to move around the room to explore the options and discuss this between themselves. **Make sure that the students understand that there is no correct answer to this task – just individual perceptions.** They are likely to identify with more than one poster, however the task is to choose the one that they think fits them best.

When they have made a decision ask them to stand next to the poster that they have chosen. Ask for volunteers to explain to the group why they stood where they stood.



Reading environmental perceptions poster.

1.1

STUDENT RESOURCE SHEET

ISLAND MAPPING PROMPT CARDS

Discuss the task card questions in groups and draw them on the island map

Environment, Health and Sanitation

Place the following on the map:

- Sources of water used by the community
- Places where wastewater is stored or disposed of
- Sources of potential water pollution
- Places where the water or land is polluted
- Places where rubbish is dumped
- Places where the septic tanks are in the household
- Places where mosquitoes breed
- Any other places linked with health issues

Environment and Livelihoods

Place the following on the map:

- Agriculture
- Land where agriculture was/is carried out
- Land with gardens or agriculture
- Places where people go fishing
- Places where people process the fish
- Places where tourists go / or could go

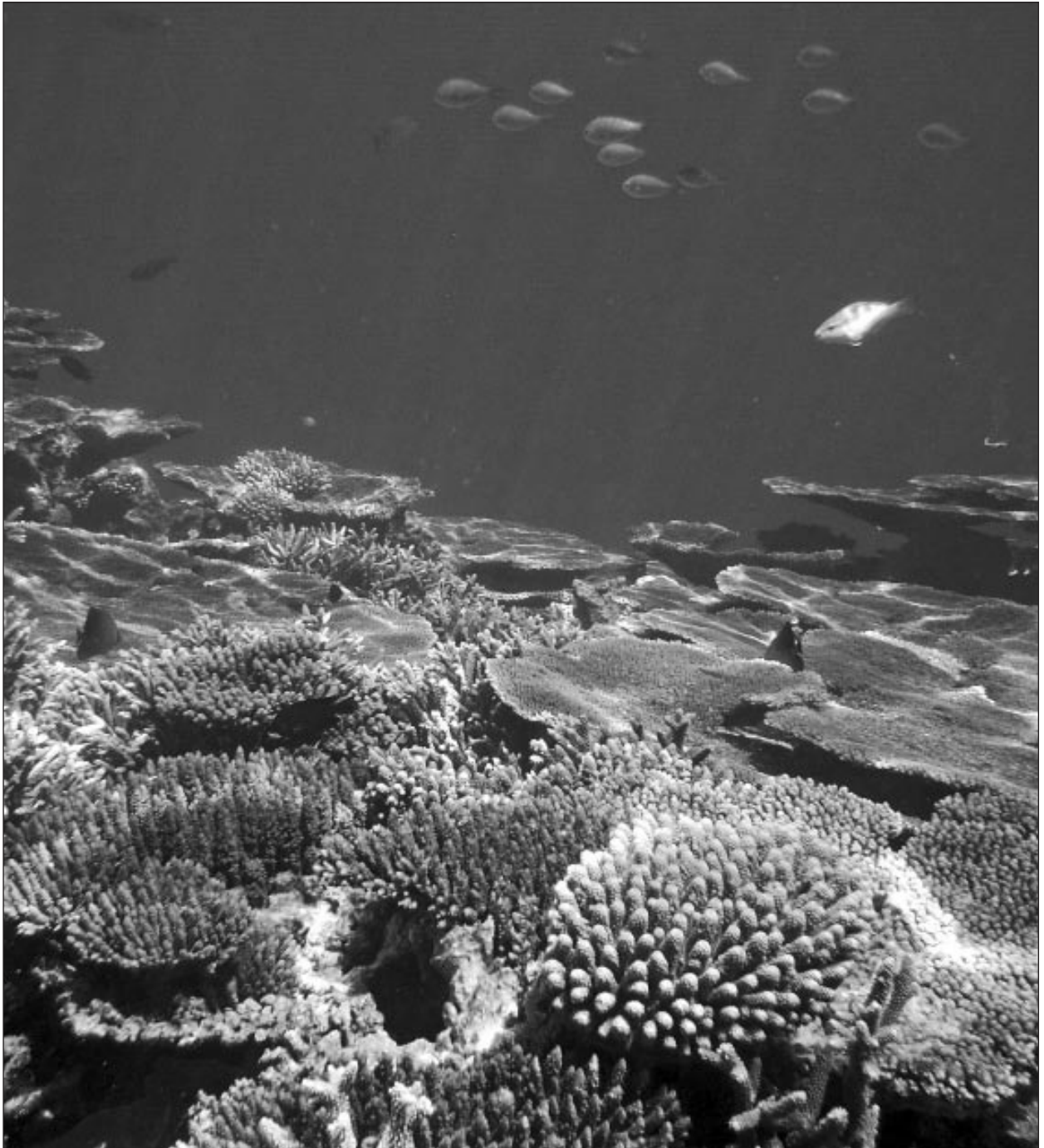
Environment and Culture

Place the following on the map:

- Places where people consider as should be preserved.
- Places where people go hunting or fishing
- Places where people gather medicinal plants
- Places where people go for recreation (e.g. picnics)
- Places with unique plants or animals
- Places valued for their scenery

1.2

STUDENT RESOURCE SHEET
ENVIRONMENTAL PERCEPTIONS



I see the environment as nature. It is to be appreciated, respected and preserved.

1.2

STUDENT RESOURCE SHEET ENVIRONMENTAL PERCEPTIONS



I see the environment as a problem which has to be solved, we need to fix up pollution, and over harvesting of our fish and forests.

1.2

STUDENT RESOURCE SHEET
ENVIRONMENTAL PERCEPTIONS

I see the environment as the whole planet, where everything is connected and we must all live together in the environment.

1.2

STUDENT RESOURCE SHEET ENVIRONMENTAL PERCEPTIONS



I see the environment as a resource. It is to be managed so that it can provide us with food, materials and medicines.

1.2

STUDENT RESOURCE SHEET
ENVIRONMENTAL PERCEPTIONS

I see the environment as a place to live, to know and learn about, to plan for and take care of. The village and garden is my environment.

1.2

STUDENT RESOURCE SHEET
ENVIRONMENTAL PERCEPTIONS

I see the environment as a community project, it's an opportunity for us to get involved and work together.

1.1

TEACHER INFORMATION SHEET
OVERVIEW OF ENVIRONMENT

Water

Water is our most precious natural resource, the planet looks blue from space as most of it is covered by water. The availability of drinking water is one of the most important issues for people and all life on Earth. On the one hand, water seems such a common substance: it covers more than 70% of the Earth's surface, and the islands of the Maldives are surrounded by it. On the other hand, the amount of fresh water that is available is very small; it is diminishing, and it is threatened by pollution of various kinds. Most, in fact 97% of



Drinking water is essential for life.



Motorcycles use non-renewable sources of energy.

the Earth's water is salty: of the 3% fresh water in the earth 2.3% is frozen and only 0.7% of this water is freshwater that we can drink. Plants and animals need water to survive. The human body is made up of approximately 70% water. While a person can survive several weeks without food, no one can go more than 4 days without drinking water.

Energy

Energy keeps the whole system working and comes from a variety of sources including: food for people and animals, electricity from burning petrol, oil, coal and natural gas. These are non-renewable sources. Electricity can also be made from the movement of water (hydro) and wind, from biomass or from the sun (solar) directly. These are all renewable sources. Non-renewable sources of energy will run out. Renewable sources will not. Currently most of the world is reliant on non-renewable sources. We need to develop our ability to generate electricity from renewable sources.

We need to use energy more efficiently as it is expensive to produce and causes pollution. All fossil fuels have to be imported into the Maldives and renewable energy sources are still being developed. If energy consumption continues to grow, as is predicted, it will be more difficult to satisfy everyone's needs. Pollution caused by the use of non-renewable resources is linked to potentially significant changes in the weather and perhaps even sea-level changes.

Biodiversity

Biodiversity is all life on earth: literally every living thing. Biodiversity is very important and is broken into 3 levels: genetic diversity, species diversity and ecosystem diversity. Genetic differences can be seen in the different varieties of chillies and coconuts. Species diversity can be seen in the great species diversity of fish. At a larger scale mangrove, coral reef and beach are the most significant ecosystems.

In the Maldives, most of the mangroves grow in areas protected by a coral reef; beaches are often found in more exposed and mobile areas. The mangroves, beaches and the coral reefs have a special relationship. The coral reef breaks and reduces the force of the waves providing the mangroves with calm waters, while the mangrove roots act as a sieve filtering water and dirt, which can harm the coral reefs. A



Mangrove habitats in the Maldives have a special relationship with coral reefs.

beach is more than a zone of loose particles found where the water meets the land; it serves a role in the development of island systems.

Waste

Waste is anything that does not have a value. Whenever waste is not properly disposed, it is considered litter. Litter is an important environmental issue that is very easy to see around us. It is a sign of the need for waste management. Waste can be dangerous to all living things and can cause a whole range of problems for everyone in the community. Litter can cause harm to wildlife and sometimes even death. Waste disposal is a major issue for the government and the community. If we minimise waste by avoiding and reducing waste, and re-using and recycling, we can cut waste by a large amount— and even more if we compost organics. With a little more thought, we can all change our habits so that each one of us throws out less waste.

Maldives Environment

The Maldives are a chain of 1,190 small low-lying coral islands grouped into 26 atolls in the Indian Ocean: 198 islands are inhabited and 80 other islands house tourist resorts. The islands are predominantly coastal entities and their ecosystems are among the most vulnerable in the world. The Maldives has a narrow economic base that relies on two critical sectors, tourism and fisheries. As these sectors form



Waste management is one of five main environmental issues in the Maldives.

the main source of employment and livelihood, protecting the Maldives' fragile coral reefs and coasts, fisheries and the marine environment from pollutants is very important. Unique geography and vulnerability poses key development challenges for the country. The dispersion of the population across the archipelago raises the cost of delivering social services, as economies of scale are difficult to achieve in service provision. This has resulted in deteriorating living conditions on many inhabited islands where the freshwater lens is at risk due to groundwater pollution and high salinity levels, as well as increasing lagoon pollution.

The State of the Environment (2004) identifies 5 main environmental issues in the Maldives: climate change and sea level rise, freshwater resources, waste management, air pollution and biodiversity conservation. In 2006 Live & Learn conducted a Rapid Assessment of Perceptions (RAP) on 5 islands to find out the main environmental issues of concern to communities. These were identified as water, waste, beach erosion and health.

Livelihoods – Tourism and Fishing

The Maldives has undergone enormous social and economic changes in recent times. Within the last 5 years the overall population has increased by 10%, while the urban population increased more than that of the rural population (MEC, 2004). Tourism, fisheries and agriculture are all significant income generating sectors in the Maldives. Fisheries remain the principal livelihood to the majority of atoll populations. Tourism accounts for 32.7% of GDP (MEC, 2004). The country has developed to such a point that, prior to the tsunami, the United Nations endorsed the graduation of the country from the group of least developed countries (MEC, 2004).

However the tsunami has highlighted the vulnerability of these sectors and the government must be encouraged to work with communities in ensuring these sectors are safeguarded.

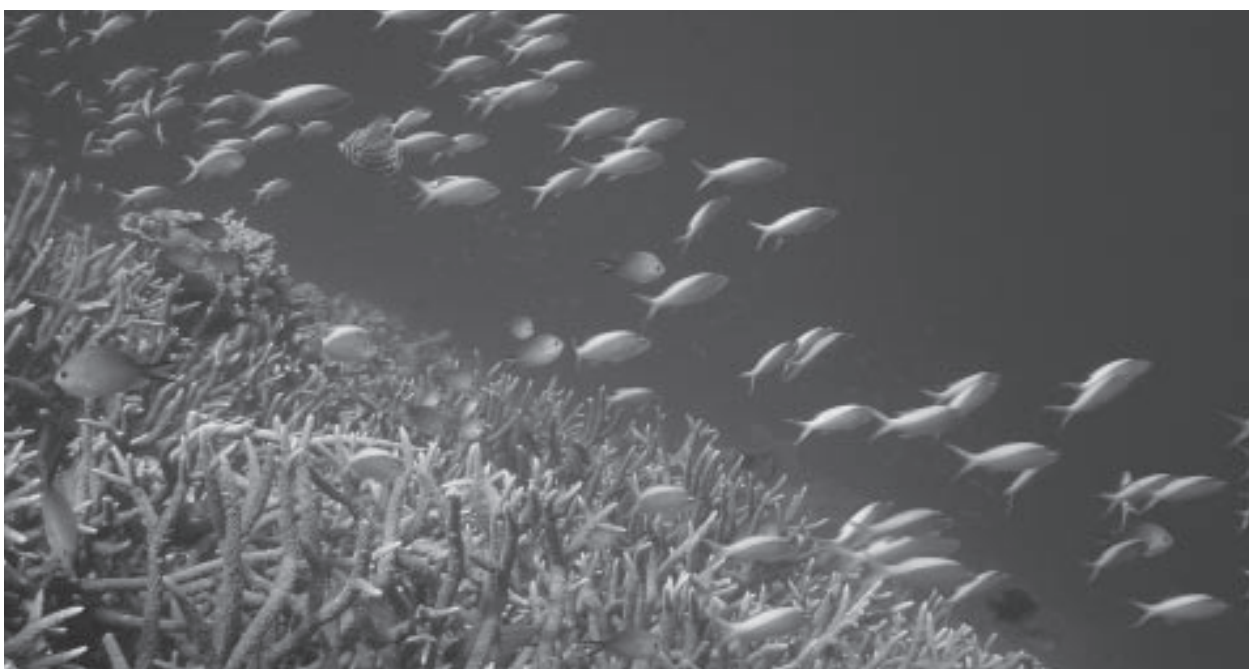
A joint government and donor report “The Maldives: one year after the tsunami” states:

‘Prior to the tsunami, the Maldives benefited from twenty-five years of economic growth that resulted in a per capita



Fishing in the Maldives is a very important livelihood.

income in excess of US\$2,100- compared to an average of around US\$500 per capita for the rest of South Asia. Much of the growth was due to the emergence of the Maldives as a major tourist destination, attracting upwards of 500,000 visitors annually. Direct revenues earned from the sector contributed directly to a third of GDP, and its wider impact accounted for more than 70% of GDP...The fisheries sector (fishing and fish processing) is the country's second largest industry, contributing roughly nine percent to GDP in 2004, and has continued to grow since the tsunami...About half of all cultivated land on the inhabited islands was destroyed by the intrusion of salt water, with agricultural losses estimated at US\$6.46 million. Apart from the fields, perennial trees such as coconuts, breadfruits, mango, betel leaf, guava, and water apple were uprooted by the waves or died from salt toxicity. Banana was also severely damaged, given its susceptibility to salt stress’.



Coral reefs are the most common ecosystems in the Maldives.

1.2

TEACHER INFORMATION SHEET
RESOURCE MAPPING AND RANKING

Resource Mapping

This tool can be used inside or outside. It is designed to get participants to visually represent an area as they see it. Mapping may not necessarily be about accuracy as it is based on perception. Mapping can serve to highlight group dynamics and perceptions as people discuss the way they see an area. Drawing on the map encourages people to think more about a particular issue and offers another way of expressing their views visually. This tool can be used to promote increased thought and discussion on the issues and help to gain several layers of information in a very useable format.

Where the situation allows it can be useful to start with a walk through of the community – this is typically along a main road and helps people to become engaged in the activity at a more physical level. This can be used prior to or as a ground-truth of the resource mapping exercise. This tool is used to gain physical information about an area, through participant observation and facilitator questioning. It is an external activity where the students walk along a designated course through an area. The concept is for the students to consciously look at their physical environment with a key focus such as water, resources, problems, solutions etc.

A completed island map.



Ranking

Ranking allows the students to work through the issues and as a group prioritise them into a ranked order. This leads to group discussion about perceptions of importance. More issues may also arise as students explain the importance of different issues. Prior to ranking, the issues need to be highlighted by the group. Listing is a documentation tool that requires the participants to list what they see as the key issues. This tool can be linked to other tools and used to summarize issues for further discussion and/or ranking. It can be important in-group verification of the data collected before it is documented.



Ranking of environmental issues.

2

LIVING BY TRADITIONAL KNOWLEDGE

Grades: 4 to 5

Number of lessons: 3 to 4

Purpose

There are many different ways of looking at people and their social and natural environment. The perspective of the Western (or Northern) world is often the dominant one in schools today. The purpose of this Module is to encourage students to explore the traditional or local knowledge of people in their country and to analyse its value for living a better, more sustainable, life today.

Key questions

Key focus questions for this section are:

- Who are the Indigenous people of the world?
- What is Traditional knowledge? Why is it important?
- What are the similarities between traditional and modern life in the Maldives?
- How is the Traditional knowledge of the Maldives being used today?

Links with other Modules

Resources from the Environment

Toolbox

Reference books

National Centre for Linguistics and Historical Research (2004) *Dhivehi raajeyga Huri Aasaaree Thanthan*

National Centre for Linguistics and Historical Research (2002) *National Museum*

Naseema Mohamed and P.Ragupathy (2005) *Inscriptions of Maldives No 1* National Centre for linguistics and Historical Research

Naseema Mohamed (2006) *Essays on early Maldives*, National Centre for Linguistics and Historical Research

Dr.Philos Egil Mikkelsen (2000) *Archeological excavations of a Monastery at 7. Kaashidhoo*, National Centre for Linguistics and Historical Research

National Centre for Linguistics and Historical Research (2006) *Vihivana garunuge thereyga Dhivehi Raajje 1*, Novelty press

National Centre for Linguistics and Historical Research (2006) *Vihivana garunuge thereyga Dhivehi Raajje 2*, Novelty press

National Centre for Linguistics and Historical Research (2006) *Vihivana garunuge thereyga Dhivehi Raajje 3*, Novelty press

National Centre for Linguistics and Historical Research (2006) *Vihivana garunuge thereyga Dhivehi Raajje 4*, Novelty press

Flip Charts

Environment and Biodiversity Flip Chart

Preparation

You will need the Environment and Biodiversity Flip Chart page “Traditional Knowledge theory” for the beginning of this section. Read *Teachers Information Sheet 2.1* in order to familiarise yourself with the meaning and importance of traditional knowledge.

Arrange at least four people from the community who have knowledge of traditional culture and traditional practices to be available for students to interview. Make copies of *Student Resource Sheets 2.1, 2.2, 2.3, 2.4 and 2.5* for each student (or group).

2.1 TUNING IN

The following activities help to engage and focus students' interest on the topic.

ACTIVITY 1: PEOPLE OF THE WORLD

Purpose: To identify Indigenous people and the countries they belong to.

Time: Approx. 20 minutes

Materials Required: Pens and pencils

Resource/ Information Sheets: 2.1 Student Resource Sheets - Blank map of the world

Procedure

Explain that the term "Indigenous" means "belonging to" or "always lived in a particular place" They are the "traditional people". Explain that there are about 5,000 different groups of Indigenous people living in seventy countries around the world. The total world population of indigenous people is estimated at 300 million. Every year on August 9 the United Nations celebrates International Day of the world's Indigenous Peoples.

Give out a copy of *Student Resource Sheet 2.1*, and ask students to mark the following countries and the indigenous people/nations that live there:

- Native North Americans
- Inuit of Alaska
- Maori of New Zealand
- Ikung (Bushmen) of the Kalahari Desert
- Melanesian People of The Pacific
- Aborigines of Australia
- Bedouin of North Africa
- First Nations of Canada
- Native Hawaiians
- Ainu of Japan
- Polynesian People of The Pacific
- Yanomani of the Amazon
- Saami of Scandinavia

Ask students if they know the names and home countries of other indigenous people. Add these to the map also. Also ask the students if they know how people migrated to the Maldives. Refer to the reference books in the toolbox for more information about this.

2.2 DECIDING DIRECTIONS

The following activities will assist students to decide on the directions they wish to take in their research.

ACTIVITY 2: TRADITIONAL AND MODERN LIFE

Purpose: To share information about traditional and modern life in the Maldives.

Time: Approx. 30 minutes

Materials Required: Environment and Biodiversity Flip Chart.

Procedure

Ask students to share with a friend what they know of the following aspects of traditional and modern life in the Maldives:



▼ *Modern dhoni.*

▲ *Traditional dhoni.*



- Where their ancestors came from and how they arrived here
- Similarities between how they live now and traditional ways of living
- Differences between how they live now and traditional ways of living
- Reasons for changes from traditional to modern ways of living

Ask students to report to the whole class and make a summary on the board. Show and discuss with students the Environment and Biodiversity Flip Chart page “Traditional Knowledge”.

2.3 FINDING OUT

The following activities involve students in shared experiences that provide new information about the topic and stimulate curiosity.

ACTIVITY 3: NOW AND THEN

Purpose: To find out about and record differences between traditional and modern ways of life in the Maldives by interviewing members of the community.

Time: Approx. 30-40 minutes

Materials Required: pen

Resource/ Information Sheets:

2.2 Student Resource Sheet – Health and Medicines

2.3 Student Resource Sheet – Sanitation

2.4 Student Resource Sheet – Resource Management

2.5 Student Resource Sheet – Fishing



Traditional weaving in the Maldives.

Procedure

One outcome of activity 2 may be that students do not feel confident about their knowledge on this Module. Hence, the remainder of this Module involves meeting community leaders and elders and interviewing them to find answers to such questions, especially related to:

- the ways in which traditional knowledge is/was used
- the status of this knowledge today
- the advantages or disadvantages of any changes.

The interviews will focus on four ways in which traditional knowledge is/was used to live more self sufficiently/sustainably. They are:

- Health and Medicines
- Sanitation
- Resource Management
- Fishing

Students should be divided into four groups for this, with each group allocated one topic.

Give each student (or group) their interview sheets (*Student Resource Sheets 2.2, 2.3, 2.4 and 2.5*)

Give students practice in being an interviewer and recorder of information, and remind them of courtesies when there are visitors to the school and they are speaking to senior people.

Arrange a time for the community leaders and elders to come to school for the interviews.

Allow students 30-40 minutes for their interviews.

2.4 SORTING OUT

Students at this stage will be collating, processing, analyzing and presenting the information in a variety of ways. Students will have the opportunity to further explore any questions that may have arisen when they were investigating. This would also be a good time to revisit some of the initial activities from Tuning In or Deciding Directions sections, for the students to witness how their knowledge has increased.

ACTIVITY 4: SHARING KNOWLEDGE

Purpose: To share and sort out information collected in activity 3 about the differences between traditional and modern ways of life in the Maldives.

Time: Approx. 20-25 minutes

Materials Required: N/A

Resource/Information Sheets: Completed Student Resource Sheets 2.2,2.3,2.4, 2.5

Procedure

Ask each group to report its findings to the class in terms of the resources used for different purposes traditionally and today.

These can be summarised on the board in columns.

Discuss the similarity and differences between the group reports.

Assist students to write thank you letters to the community leaders and elders that they interviewed.

2.5 DRAWING CONCLUSIONS

The following activities will help students to interpret information, establish connections and confirm/reject or modify predictions.

ACTIVITY 5: MORE AND LESS USEFUL

Purpose: To draw conclusions on what they have learnt about traditional practices and resources.

Time: Approx. 20 minutes

Materials Required: N/A

Resource/Information Sheets: Completed Student Resource Sheets 2.2,2.3,2.4, 2.5

Procedure

Ask students to make a list of the traditional practices and resources that were reported to be:

- i. less useful than contemporary (current) ones, and
- ii. more useful than contemporary (current) ones?

Ask students to identify what the items in each list have in common. That is,

- What do the traditional practices that are seen as more useful have in common?
- What do the traditional practices that are seen as less useful have in common?

What strategies might be used to continue the traditional practices that are seen as more useful?

Discuss: is it necessary to preserve the traditional practices that are seen as less useful? Why or why not?

2.6 CONSIDERING, PLANNING AND TAKING ACTION

As a result of students being actively involved in decision-making throughout the inquiry process, it is hoped that they will be empowered to take action which has positive personal, community and global effects.



There is much traditional knowledge about plants in the Maldives.

ACTIVITY 6: PROMOTING TRADITIONAL KNOWLEDGE

Purpose: To consider, plan and take action on traditional knowledge on the island.

Time: Minimum 30 minutes

Materials Required: Pen and paper

Resource/Information Sheets: N/A

Procedure

Discuss with students ways to raise awareness on this subject in your community. Some suggestions for taking action on your island include:

- Write to the island authorities about the need to protect areas where medicinal plant species grow on the island.
- Sit down with community leaders and elders and prepare a picture book for other students about traditional knowledge on your island.
- Write a brochure for public distribution to raise awareness of the importance of preserving traditional knowledge now and for future generations.

2.7 EVALUATION AND REFLECTION

At this stage it may become evident that there is a need to return to some stages of the inquiry process to clarify knowledge or refine skills.

The following questions may be asked:

- Are you happy with the ways in which your information was gathered, analysed and presented?
- Is there anything you would change?
- Are there things you need to investigate further?

ACTIVITY 7: LESSONS LEARNT

Purpose: To reflect upon what students have learnt.

Time: Minimum 30 minutes

Materials Required: Pen and paper

Resource/Information Sheets: N/A

Procedure

Ask students to write down:

- Four important ideas/concepts/information/values I have learnt in this Module are
- Two things I now want to do for myself and for others are.....

Ask students to decide what they would like to do with the results of their research and discussion. Possibilities include:

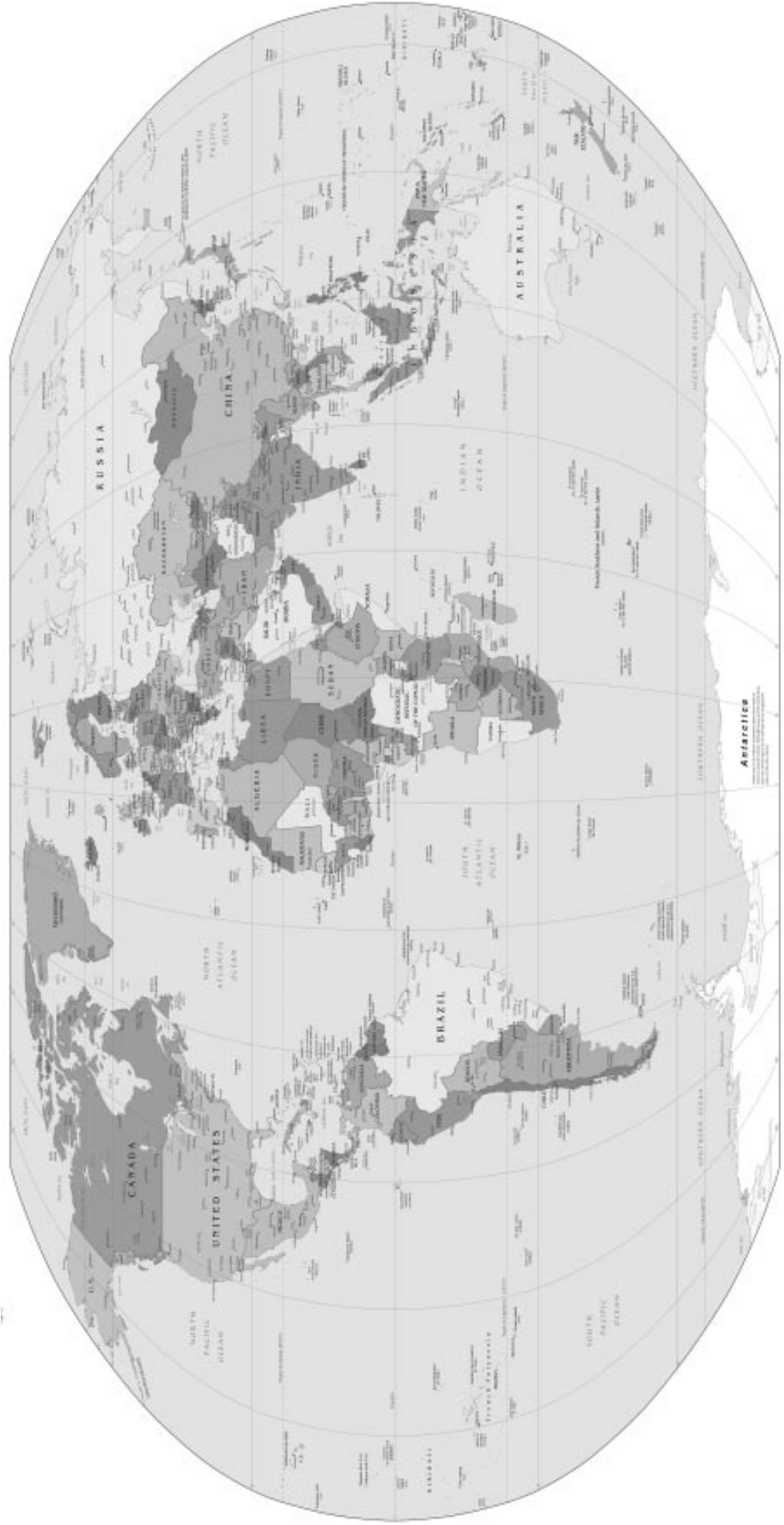
- Making a set of posters comparing the four themes (health and medicine, sanitation, resource management and fishing) today and traditionally.
- Writing a story or play about the changes in the way things are now done (and some of the problems it causes) and how traditional knowledge can help solve the problem.
- A display might be made of the posters, and a concert held featuring traditional stories and songs and the students' plays and stories.

Ask the students to draw a family tree showing how their ancestors came to the Maldives.

2.1

STUDENT RESOURCE SHEET BLANK MAP OF THE WORLD

Find the countries on the map and write the names of the Indigenous people/nations that live there.





STUDENT RESOURCE SHEET

HEALTH AND MEDICINES

Interview a community leader/elder and fill in answers to the questions

TRADITIONAL PRACTICE	CURRENT PRACTICE
<p>1. Cures for Various Illnesses or Wounds</p> <p>Examples of traditional practices</p> <p>Resources (e.g. herbs) used and how obtained</p> <p>Are these practices used very often today?</p>	<p>1. Cures for Various Illnesses or Wounds</p> <p>Examples of current practices</p> <p>Resources used and how obtained</p> <p>Are there practices more or less useful than traditional practices? Why?</p>
<p>2. Preventative Measures Against Insect pests, e.g. flies, mosquitoes, cockroaches etc.</p> <p>Examples of traditional practices</p> <p>Resources used</p> <p>Are these practices used very often today?</p>	<p>2. Preventative Measures Against Insect pests, e.g. flies, mosquitoes, cockroaches etc.</p> <p>Examples of current practices</p> <p>Resources used and how obtained</p> <p>Are there practices more or less useful than traditional practices? Why?</p>

TRADITIONAL KNOWLEDGE

2.3

STUDENT RESOURCE SHEET SANITATION

Interview a community leader/elder and fill in answers to the questions.

TRADITIONAL PRACTICE	CURRENT PRACTICE
<p>1. Waste Disposal</p> <p>Examples of traditional practices</p> <p>Resources used and how obtained</p> <p>Are these practices used very often today?</p>	<p>1. Waste Disposal</p> <p>Examples of current practices</p> <p>Resources used and how obtained</p> <p>Are there practices more or less useful than traditional practices? Why?</p>
<p>2. Getting Clean Water</p> <p>Examples of traditional practices</p> <p>Resources used</p> <p>Are these practices used very often today?</p>	<p>2. Getting Clean Water</p> <p>Examples of current practices</p> <p>Resources used and how obtained</p> <p>Are there practices more or less useful than traditional practices? Why?</p>

TRADITIONAL KNOWLEDGE

2.4

STUDENT RESOURCE SHEET RESOURCE MANAGEMENT

Interview a community leader/elder and fill in answers to the questions.

TRADITIONAL PRACTICE	CURRENT PRACTICE
<p>1. Taboos against Certain Animals and Plants</p> <p>Examples of traditional practices</p> <p>Resources used</p> <p>Are these practices used very often today?</p>	<p>1. Taboos against Certain Animals and Plants</p> <p>Examples of current practices</p> <p>Resources used and how obtained</p> <p>Are there practices more or less useful than traditional practices? Why?</p>
<p>2. Preservation of Trees, Mangroves and Coral</p> <p>Examples of traditional practices</p> <p>Resources used</p> <p>Are these practices used very often today?</p>	<p>2. Preservation of Trees, Mangroves and Coral</p> <p>Examples of current practices</p> <p>Resources used and how obtained</p> <p>Are there practices more or less useful than traditional practices? Why?</p>

TRADITIONAL KNOWLEDGE

2.5

STUDENT RESOURCE SHEET FISHING

Interview a community leader/elder and fill in answers to the questions.

TRADITIONAL KNOWLEDGE

TRADITIONAL PRACTICE	CURRENT PRACTICE
<p>1. Making Lines and Nets</p> <p>Examples of traditional practices</p> <p>Resources used</p> <p>Are these practices used very often today?</p>	<p>1. Making Lines and Nets</p> <p>Examples of current practices</p> <p>Resources used and how obtained</p> <p>Are there practices more or less useful than traditional practices? Why?</p>
<p>2. Making Boats</p> <p>Examples of traditional practices</p> <p>Resources used</p> <p>Are these practices used very often today?</p>	<p>2. Making Boats</p> <p>Examples of current practices</p> <p>Resources used and how obtained</p> <p>Are there practices more or less useful than traditional practices? Why?</p>

2.1

TEACHER INFORMATION SHEET TRADITIONAL KNOWLEDGE

Traditional knowledge is the local knowledge that is unique to a culture or society. Other names for it include: 'local knowledge', 'folk knowledge', 'people's knowledge', 'traditional wisdom' or 'traditional science'. Traditional knowledge is possessed by Indigenous peoples around the world, as well as other peoples who have maintained a very close relationship to the natural environment for a very long time, such as in the Maldives. For these people traditional knowledge remains important in many aspects of day to day life, such as fishing, agriculture, food preparation, health care, navigation on land and sea and interpretation of meteorology and climate (ICSU, 2002). Although the word "traditional" is used, this knowledge is far from being static. Traditional knowledge has continually evolved as each successive generation of people has met challenges, with each generation adding to the stock of knowledge.

Traditional knowledge can be distinguished from science by a number of characteristics. At a workshop held in Inuvik, Canada, in November 1995, a group of Inuit people agreed on a list of six characteristics for traditional knowledge:

- Our knowledge is practical common sense, based on teachings and experience passed on from generation to generation.
- Our knowledge is 'knowing the country'; it covers knowledge of the environment and the relationship between things.
- Our knowledge is holistic – it cannot be compartmentalised and cannot be separated from the people who hold it. It is rooted in the spiritual health, culture and language of the people. It is a way of life.
- Our knowledge is an authority system. It sets out the rules governing the use of resources – respect; an obligation to share. It is dynamic, cumulative and stable. It is truth.
- Our knowledge is a way of life – wisdom is using knowledge in good ways. It is using the heart and the head together. It comes from the spirit in order to survive.
- Our knowledge gives credibility to people.

Source: Adapted from Alan, R. Emery and Associates (1997) *Guidelines for Environmental Assessments and Traditional Knowledge. A Report from the Centre for Traditional Knowledge of the World Council of Indigenous People (draft), Ottawa, p. 3.*

Loss of traditional knowledge

Traditional knowledge is in danger of being lost around the world. Although universal formal education systems are important for human development, such universal systems may also limit the use and spread of traditional knowledge and languages by introducing 'modern' knowledge and academic ways of learning. Furthermore, as science and technologies have been adopted, traditional knowledge has often been overlooked or neglected as a resource, often discriminated against as "old wives tales". Finally the knowledge is being lost as elders, who preserve such knowledge, are dying and the facilities to document and protect such knowledge are lacking. Today, there is a grave serious risk that much traditional knowledge is being lost and, along with it, valuable knowledge about ways of living sustainably on the earth.

Traditional knowledge in the Maldives

People have lived in the Maldives for many centuries. In order to survive Maldivian people have had to maintain very close links with the environment, especially the marine environment. From this close connection with the environment, a great deal of traditional knowledge has been acquired. For example:

- Maldivians use local resources effectively. For example Maldivian boat makers have extensive traditional knowledge about how to make dhoni's from coconut wood. The traditional dhoni is one of the oldest known sea transporting vessels in the Maldives. However as more and more boats are made of fiberglass, this skill is also declining.
- Also Maldivian people can use the coconut tree in many ways, not just for food or coconut milk. For example women can make coir rope (roanu) from coconut husks, thatch leaves together to make roof materials (fangi) or baskets (vashi) or make brooms (iloshi fathi) from the mid-rib of the palm leaves. Palm toddy (raa), a sweet drink, can be made from fermented coconut sap and coconut oil (theyo), for the hair and body, can be made from heating up dried coconut and squeezing the oil out. The charcoals from the coconut shell (naashi) can be used to bake cakes or barbeque fish, or put inside an iron because the charcoals keep the heat for a long time. The fibre from the coconut palm (ilaa) can

also be used as a strainer and the coconut shell can be made into a toddy container (raa badhi).

- Maldivian fisherman identify and follow local birds to locate schools of fish;
- Maldivian fisherman use a pole and line technique which is more sustainable, compared to other fishing techniques (eg trawling which damages reefs);
- Early Maldivians studied the weather and climate carefully and based on these observations developed a Nakaiy calendar for the Maldives. The calendar predicts how minor climatic changes such as with the Monsoons (Hulhan'gu and Iruvai) affect fishing and the weather (Jauhary and Chamberlain, 1998).

There is also considerable knowledge in the area of traditional medicine. For example though traditional forms of medicine have not been completely documented, some 122 species of plants with medicinal properties have been recorded in the Maldives (Kanvinde, 1999). For example the Glory lily plant (Vihalagondi) can be used as traditional medicine. The juice of the leaves can be used to kill head lice (ERC, 2006). However with the increasing popularity of western medicine, together with loss of habitat and a lack of texts about local biodiversity this traditional knowledge is being lost.

Traditional knowledge also exists regarding agriculture. For example, local men and women on Kelaa Island are knowledgeable about and able to identify different crop varieties (FAO, 1999) and Maldivian farmers also use traditional pest control practices (Hunter, 1996). For example to prevent rats gaining access to coconuts, a split palm leaf, was placed around the trunk of the tree to stop the rats climbing up the tree (Hunter, 1996). However in recent years this traditional knowledge has been ignored as scientific technologies (such as pesticides) have been introduced.

Traditional Knowledge and Sustainable Development

To live on Earth without compromising the ability of future generations to also live here, we must achieve sustainable development. Science and technology has contributed to great improvements in human development. However science does not have all the answers. The value of traditional knowledge for sustainable development must also be recognized. By acknowledging and valuing traditional knowledge along with science, there will be a broader knowledge base from which potential approaches to sustainable development can be sourced. There is an urgent need to stop the loss of traditional knowledge and develop support programs to record, protect and conserve this knowledge.



Boat making.

Internet Resources

1. United Nations cyberschool bus project at <http://www.un.org/cyberschoolbus/indigenous> provides resources and information about Indigenous peoples and International Day of the World's Indigenous Peoples.
2. Alaskan Indigenous Knowledge Network <http://www.ankn.uaf.edu/index.html> and then select Indigenous Education Worldwide.

This is an Internet site which lists materials, contacts, links and other resources related to indigenous education issues related to:

- Nature North Americans
 - First Nations of Canada
 - Inuit
 - Native Hawaiians
 - Maori of New Zealand
 - Ainu of Japan
 - Aborigines of Australia
 - Saami of Scandinavia
 - Indigenous People of Russia
3. Native Planet www.nativeplanet.org
Native Planet is a not-for-profit organization dedicated to the worldwide preservation of threatened indigenous cultures. Using ecotourism, education, documentaries and humanitarian projects, we offer native peoples a global voice and promote the self-empowerment necessary for them to protect their own land and lifestyles. Native Planet has started an Indigenous Mapping Project and posts information on its website about Indigenous people from around the world. This

information is used by academics and NGOs amongst others to help indigenous populations maintain their language, culture, traditions and environment, so making the world a better place.

4. Indigenous Agricultural and Environmental Knowledge Systems, Center for International Earth Science Information Network (CIESIN) <http://www.ciesin.org/TG/AG/iksys.html>
CIESIN was established in 1989 as a non-profit, non-governmental organization to provide information that would help scientists, decision-makers, and the public better understand their changing world. Under their thematic guides section, CIESIN provides an introduction to the topic of indigenous knowledge with a series of papers and reports available on-line.
5. World Bank <http://www.worldbank.org/afr/ik/what.htm>
In 1998, the World Bank launched the Indigenous Knowledge for Development Program to help learn from community based knowledge systems and development practices, and to incorporate them into Bank-supported programs. A core activity was the publication and dissemination of a series of *IK Notes*, where development practitioners report on successful local solutions for local development problems. Learning from IK can improve understanding of local conditions and can help to reduce poverty.

References: ERC (2006) *'Our Medicinal Plants'* Environment Research Center, Ministry of Environment, Energy and Water

Hemal S. Kanvinde (1999) *'Maldivian Gender Roles In Bio-resource Management'* FAO, Bangkok

International Council for Science (2002) ICSU Series on Science for Sustainable Development No. 4: *'Science, Traditional Knowledge and Sustainable Development'*.

A Riyaz Jauhary, A I Chamberlain (1998) *'Understanding Fisheries Science 1'* Educational Development Center, Ministry of Education, Republic of Maldives



There is much traditional knowledge associated with the coconut palm. For example making coir rope from coconut husks.

3

ENVIRONMENTAL IMPACT ASSESSMENT

Grades: 4 to 5

Number of lessons: 4 to 6

Purpose

To link the knowledge gained in other Modules to development of an Environmental Impact Statement (EIS).

Key Questions

Key focus questions for this Module are:

- Why are EIS's important?
- Who should do EIS's?
- What information is needed to prepare an EIS?

Links with other Modules

This activity can link with most Modules, especially in the action stage where students can consider new knowledge in assessing development projects. Life Around Us, Resources from the Environment.

Preparation

Read *Teacher Information Sheets 3.1 and 3.2* in order to familiarise yourself with the Environmental Impact Assessment (EIA) process and the components of an EIS.

3.1 TUNING IN

The following activities help to engage and focus students' interest on the topic.

ACTIVITY 1: ENVIRONMENTAL IMPACTS

Purpose: To generate interest and awareness about environmental impacts.

Time: Approx. 15 minutes

Materials Required: N/A

Resource/Information Sheets: N/A

Procedure

Explain that as our population grows we need to build new homes, shops, and roads, so we are increasingly called upon to make tough decisions. How can we measure the impact of a project on its immediate area, and its area downwind and downstream, in order to evaluate these alternatives? When a big project is planned for a sensitive environmental space, the “developers” must write an Environmental Impact Statement describing the impact of the project, often a building, on the environment around it.

Warm up by discussing all the ways a new building impacts the land and life on that land. You might include the building process and disposal of its waste, changes in temperature and light, the impact on the neighbourhood, the resources the new building brings to people in its vicinity.



Certain projects require an EIA in the Maldives.

3.2 DECIDING DIRECTIONS

The following activities will assist students to decide on the directions they wish to take in their research.

ACTIVITY 2: DEVELOPMENT IN THE MALDIVES

Purpose: To identify developments taking place on the island that may require an EIA.

Time: Approx. 15 minutes

Materials Required: Pen and paper,

Resource / Information Sheets: Teacher Information Sheet 3.2- Environmental Impact Assessment Regulation 2007

Procedure

The Maldives has established an EIA Regulation called the *Environmental Impact Assessment Regulation 2007*' (<http://www.erc.gov.mv>). A requirement for the EIS is a description of the affected environment, and anticipation of direct or indirect impact upon this environment of the proposed plan. The heart of the EIA is the statement of key issues and alternatives that need to be addressed before the proposed building proceeds.

Ask students to make a list of the types of new development that is occurring on their island currently. Ask students whether they think these activities might require an EIA.

Ask students to write their lists on the board for discussion. Explain that an EIA is not required for small everyday developments, but for larger developments such as resort construction and land reclamation projects. Using *Teacher Information Sheet 3.2* highlight those activities that are listed in the Environmental Impact Assessment Regulation that may require an EIA. However where possible we should always consider the environmental impacts on any new project, such as building a new house or boat.

3.3 FINDING OUT

The following activities involve students in shared experiences that provide new information about the topic and stimulate curiosity.

ACTIVITY 3: CONDUCT AN ENVIRONMENTAL IMPACT ASSESSMENT (EIA)

Purpose: To conduct an environmental impact assessment of an imaginary development proposal.

Time: Approx. 20 minutes

Materials Required: Map of the island

Resource / Information Sheets: Student Resource Sheet 3.1 - Environmental Impact Assessment

Procedure

Imagine there is a proposal to build a new 50 bed hospital on your island. Students will need a map of the island and copies of *Student Resource Sheet 3.1*.

- Brainstorm some impacts of a building project. Groups of students could meet to brainstorm a list of possible impacts, and later join their list into a master list.
- Visit the proposed site. In groups describe the site itself. Is the land wet or dry? Size? What is it surrounded by? Aesthetic significance? Historic significance? Religious significance? Tourism significance?
- Identify the flora and fauna present on the site (to species if possible). This is called a baseline. What are the most common species? Are there any endangered species? Are there introduced species? Are the species critical to the support of other species?
- Find out the local history: Have the plants and animals changed over the last fifty years? Can older people remember how the land has been used during their lifetime?
- Alternatives and Mitigation Measures: What are the choices for the builders? Try to develop 3 alternatives. Are there ways to compensate for changes to the natural habitat caused by building? (Relocation of species? Rebuilding of habitats? Protection of remnants?)



Students visiting proposed development site.

3.4 SORTING OUT

Students at this stage will be collating, processing, analysing and presenting the information in a variety of ways. Students will have the opportunity to further explore any questions that may have arisen when they were investigating. This would also be an opportune time to revisit some of the initial activities from Tuning in or Deciding Directions sections, for the students to witness how their knowledge on EIA has increased.

ACTIVITY 4: PREPARE AN ENVIRONMENTAL IMPACT STATEMENT

Purpose: To collate data gathered from activity 3 in the development of an EIS.

Time: Approx. 30 minutes

Materials Required: Pen and paper

Resource / Information Sheets: Completed Student Resource Sheet 3.1

Procedure

Using the information collected in Activity 3 prepare an EIS. Each group can prepare a different section of an EIS using the headings below as a guide. You can include photos, maps, diagrams and tables to support your conclusions.

Headings for an EIS

1. Description of the proposed project
 - a. Describe the need for the project
 - b. The boundaries of the area
 - c. A location plan
2. Existing environment
 - a. Describe all aspects of the natural environment (e.g. flora and fauna, marine environment, beach environment)
 - b. Describe all aspects of the human environment (e.g. population numbers, economic activities)
 - c. Describe the data collection methods
3. Public Consultation
 - a. Describe who will be affected by the project.
 - b. Describe how stakeholders have been consulted.
4. Impact Prediction
 - a. Describe possible impacts on natural and human environment.
 - b. Identify significant impacts.
5. Identify Alternative and Mitigation Measures
 - a. Describe 3 alternatives
 - b. Describe how adverse environmental impacts can be reduced or mitigated.

3.5 DRAWING CONCLUSIONS

The following activities will help students to interpret information, establish connections and confirm/reject or modify predictions.

ACTIVITY 5: PRESENTING AN EIS

Purpose: To present the main conclusions from the EIS developed in activity 4.

Time: Approx. 30 minutes

Materials Required: Completed EIS from activity 4

Resource / Information Sheets: N/A

Procedure

In activity 4 each group has prepared a different section of the EIS. Each group can then present a summary of the main findings to the whole class.

Once each group has presented their conclusions, ask the following questions to the class:

- Based on the findings would you allow the development to proceed or not? Why?
- How did you come to your decision?

By now students should have the understanding that:

- there are links between human activity and survival of animals and plants
- it is our responsibility to look after the environment, as we can be affected too.

Links can exist between actions such as conservation of endangered habitats and the living creatures within them. Environmental Impact Assessments are designed to reduce the negative impacts from human activities.

3.6 CONSIDERING, PLANNING AND TAKING ACTION

As a result of students being actively involved in decision-making throughout the inquiry process, it is hoped that they will be empowered to take action which has positive personal, community and global effects.

ACTIVITY 6: DEVELOPMENT PROPOSALS ON MY ISLAND

Purpose: To consider, plan and take action to assess current or future environmental impacts on the island.

Time: Minimum 30 minutes

Materials Required: Pen and paper, markers

Resource / Information Sheets: N/A

Procedure

Discuss with students ways to raise awareness on this subject in your community. Some suggestions for taking action on your island include:

- Prepare an EIS for a development proposed for your island.
- Write to the island authorities about the need for EIS's for major developments.
- What would you do about the EIA process in the Maldives if you were in government?
- Write a brochure for public distribution to raise awareness of the importance of EIA.

3.7 EVALUATION AND REFLECTION

At this stage it may become evident that there is a need to return to some stages of the inquiry process to clarify knowledge or refine skills. The following questions may be asked:

- Are you happy with the ways in which your information was gathered, analysed and presented?
- Is there anything you would change?
- Are there things you need to investigate further?

ACTIVITY 7: LESSONS LEARNT

Purpose: To reflect upon what students have learnt.

Time: Approx. 20 minutes

Materials Required: Pen and paper

Resource / Information Sheets: N/A

Procedure

Ask students to write down:

- Four important ideas/concepts/information/values I have learnt in this Module are
- Two things I now want to do for myself and for others are.....

Ask students to decide what they would like to do with the results of their research and discussion. One of the possibilities might be to write a story or play about EIA.

Students could record the concepts they have developed in a poster or an information brochure on environmental impact assessment.



STUDENT RESOURCE SHEET

ENVIRONMENTAL IMPACT ASSESSMENT

Complete this sheet by filling in answers to the following questions.

<p>Discuss some impacts of a building project.</p>	
<p>Characterize the site itself.</p> <p>Visit, describe, and further characterize the natural setting for the proposed building. Is the land wet or dry? Size? Surrounded by? Aesthetic significance? Historic significance? Religious or cultural significance?</p>	
<p>Characterize life on the site</p> <p>Get a baseline of flora and fauna (to species if possible)</p> <p>What are the most common species? Are there any endangered species? Are there introduced species?</p>	
<p>Consider the importance of life on the site.</p> <p>- If a building project goes ahead on this site what kinds of positive and negative impacts will there be:</p> <ul style="list-style-type: none">- on the natural environment- on the human environment	
<p>Alternatives and Mitigation Measures</p> <p>What are the choices for the builders? Try to develop 3 alternatives.</p> <p>Are there ways to mitigate or reduce changes to the natural habitat caused by building? (Relocation of species? Rebuilding of habitats? Protection of remnant habits?)</p>	

3.1

EXAMPLE OF COMPLETED STUDENT RESOURCE SHEET ENVIRONMENTAL IMPACT ASSESSMENT

Complete this sheet by filling in answers to the following questions.

Discuss some impacts of a building project.	clearing of trees, noise, dust, construction waste
Characterize the site itself. Visit, describe, and further characterize the natural setting for the proposed building. Is the land wet or dry? Size? Surrounded by? Aesthetic significance? Historic significance? Religious or cultural significance?	The site is flat and is dry. It is 100m x 100m wide with many trees, including a large Nika tree. It is next to the school. This site does not have any historical or religious significance, but children like to play under the Nika tree and bats like to roost in this tree when it is fruiting.
Characterize life on the site Get a baseline of flora and fauna (to species if possible) What are the most common species? Are there any endangered species? Are there introduced species?	There is one large old Nika tree, 5 coconut trees, 10 Magoo, 10 Kuredi and 5 Boashi. There are bats in the Nika tree and a grey heron (Maakana) has a nest in one of the coconut trees. Bondu lizards also like to live in these trees.
Consider the importance of life on the site. - If a building project goes ahead on this site what kinds of positive and negative impacts will there be: - on the natural environment - on the human environment	If a hospital is built on this site the trees will have to be removed, including the old Nika tree. This will affect the animals on the site, such as bats, the heron and the bondu's.
Alternatives and Mitigation Measures What are the choices for the builders? Try to develop 3 alternatives. Are there ways to mitigate or reduce changes to the natural habitat caused by building? (Relocation of species? Rebuilding of habitats? Protection of remnant habits?)	The builders could choose a site away from the Nika tree- maybe near the football field where the land has already been cleared. They could choose a site on another island. They could build around the Nika tree. Mitigation measures- They could reduce the impact by building the hospital around the Nika tree. Maybe they could plant more trees at the other end of the island to make up for the ones they have to clear.

3.1

TEACHER INFORMATION SHEET ENVIRONMENTAL IMPACT ASSESSMENT

The purpose of environmental impact assessment (EIA) is to investigate and analyse all the potential impacts a proposed development project has on the environment. An EIA should include an assessment of both the short and long-term effects and it needs to deal with uncertainties. It shall guarantee the involvement of all stakeholders in the decision-making process and the consideration of their concerns. In an ideal situation, the environment is considered in its broadest sense and thus, the EIA examines the potential effect the proposed project has on the following areas:

- the natural environment, including air, water, soil and the animal world
- the social environment
- the cultural aspects of the environment
- the physical resources
- the aesthetic of the impacted area
- living and health and safety standards, including noise pollution
- local services

From the above it follows that in order to conduct an EIA, we need to identify who the stakeholders are. This includes the natural environment as well as the community, and their key issues and concerns are to be determined (scoping). From a legislative perspective it needs to be established of whether or not an EIA is required (screening). Furthermore, alternatives and objectives need to be examined, which means discussing alternative sites, techniques and the project's purpose as such (identifying and evaluating alternatives). It is to be investigated how to prevent, minimise and manage the potential adverse effects of the project (mitigating measures dealing with uncertainty). Finally, the findings need to be communicated and presented for discussion (issuing an environmental statement).

An EIA is to be conducted before a development project is being implemented. The process of examining all potential consequences is in advance of decision-making for the project. The process of environmental impact assessment however should continue beyond the planning phase. It should extend from the initial concept of the proposal through implementation to commissioning and operation and, where appropriate, decommissioning.

From the perspective of the developer, the purpose of the EIA process is:

- to support the goals of environmental protection and sustainable development
- to integrate environmental protection and economic decisions at the earliest stages of planning an activity
- to predict environmental, social, economic, and cultural consequences of a proposed activity
- to assess plans to mitigate any adverse impacts resulting from the proposed activity
- to provide for the involvement of the public, department of the Government and Government agencies in the review of the proposed activities
- to issue an environmental statement and report the findings

In general, EIA is enforced by an environmental protection authority of a government, which in the Maldives falls under the Ministry of the Environment, Energy and Water. For more information about EIA in the Maldives look at www.erc.gov.mv.

(Find more on: <http://www.gdrc.org/uem/eia/define.html>;
<http://www.env.go.jp/earth/coop/coop/materials/10-eiae/10-cover10.pdf>)

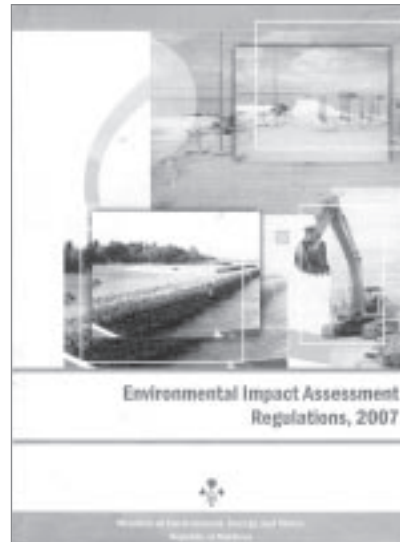
3.2

TEACHER INFORMATION SHEET

ENVIRONMENTAL IMPACT ASSESSMENT REGULATION 2007

Schedule D- List of Development Proposals Requiring an Environmental Impact Assessment Study

- Development of new tourism resorts
- Additions and large-scale developments to resorts
- Aquaculture projects
- Fish processing facilities
- Artificial reefs
- Agriculture projects
- Livestock and animal husbandry
- Large scale deforestation
- Construction/Dredging of Harbours
- Cutting, dredging and maintenance of channels
- Construction of jetties
- Development of Marinas
- Land Reclamation projects
- Sea defense structures (such as seawalls, revetments, marine installation, offshore breakwaters, groynes)
- Beach nourishment
- Construction of major roads
- Development of Airports
- Helipads/Seaplane hubs
- Major housing projects
- Development of Factories
- Incinerators
- Landfills
- Large-scale Waste storage and separation facilities
- Bottling plants
- Water supply projects
- Sewerage projects
- Marine outfall pipes
- Power plants
- Oil, fuel and gas storage, handling and refining facilities
- Desalination plants
- Hospitals



4

COMMON DISEASES AND PREVENTION

Grades: 1 to 3

Number of lessons: 4 to 6

Purpose

The purpose of the series of activities in this section is to develop the students' understanding of the link between hygiene and sanitation and their health. They will learn personal hygiene practices as related to washing hands and protecting well water, and how to promote personal health. In addition, the activities will lead children to explore about common diseases that affect their community and critically think about their roles and responsibilities within this context.

Key questions

Key focus questions for this section are:

- What are the common diseases in the island and in the country?
- What are the causes of these diseases?
- In what ways could the environment be improved to make it safe so that the community could live a healthy life?

Links with other Modules

Resources from the Environment and Ourselves.

Toolbox

CD containing UNICEF hygiene and sanitation TV advertisement clips

Preparation

Read through this section of the Module first. You need to make a number of decisions on what activities you choose to conduct with your particular group of students. This will then also help you decide what preparation is required, and particularly what activities, notes, drawings, paintings or other artwork are best suited

Read *Teacher Information Sheets 4.1 and 4.2* in order to familiarise yourself with information about common diseases and UNICEF hygiene and sanitation TV advertising clips.

Arrange at least two people from the health centre to be available for students to interview.

4.1 TUNING IN

The following activities help to engage and focus students' interest on the topic.

ACTIVITY 1: SHAKING WET HANDS IN A CIRCLE

Purpose: To learn about the importance of washing hands.

Time: Approx. 30 minutes.

Materials required: Soap, water, paper towel

Resource/ Information Sheets: N/A

Procedure

The students stand in a circle.

One student will wet one of her/his hand and shake the hand of her/his neighbour who then shakes the hand of the other neighbour and so on. The students will be surprised how many of them will still feel the wetness in the hand.

Lead a discussion based on this experience. Introduce the idea that most intestinal, stomach, and cold viruses are spread by our hands. Through touch, micro organisms are transferred from the fluids in the nose and mouth of one person to something (e.g., a pencil, food, a phone) or to someone else. When other people bring their hands or the object near their mouths, the bacteria or viruses may find a new home.

Lead a discussion about what might constitute good hand washing practice. The students will learn that safe hygiene practices include good washing of hands as follows:

- use sufficient water
- use soap
- rub both hands at least 3 times vigorously
- rinse thoroughly
- hands should be rubbed dry with a clean towel.

Ask students when they should wash their hands.

Some examples include:

- after using the bathroom
- before lunch
- after interval time
- after blowing your nose
- after coughing
- after playing outside



Teacher showing how to wash hands correctly.

Demonstrate the steps for good hand washing technique to your students.

1. Wet your hands with running water.
2. Put a small amount of liquid soap¹ in the palm of one hand.
3. Rub your hands together for 20 seconds so you produce lather. Make sure you scrub between your fingers, under your fingernails and the backs of your hands.
4. Rinse your hands well with clean running water for at least 10 seconds. Try not to handle the taps once your hands are clean. Use a paper towel to turn off the water.
5. Dry your hands with a single use paper towel. If you use a hand towel be sure to change it daily.

Repeat the demonstration, this time have the students sing a well known song like “*Twinkle Twinkle Little Star*” while rubbing their hands together. This will teach them the amount of time it takes to clean their hands properly. To make washing hands more fun, you can have students create songs that are 15 seconds long.

Repeat the activity, this time the students should demonstrate the steps for good hand washing technique using soap singing the song.

¹ Bar soaps are not as hygienic as liquid soaps because they stay moist and attract germs. If a bar soap is the only option it should be stored on a rack so that the bar doesn't sit in water. <http://www.mayoclinic.com/health/hand-washing/HQ00407>

4.2 DECIDING DIRECTIONS

The following activities will assist students to decide on the directions they wish to take in their research.

ACTIVITY 2: UNICEF HYGIENE EDUCATION VIDEO CLIP #1

Purpose: Participate in whole class discussion about unsafe hygiene practices.

Time: Approx. 20 minutes.

Materials required: CD/DVD player, UNICEF hygiene video clip #1

Resource/ Information Sheets: N/A

Procedure

Show the UNICEF – hygiene education video clip #1 to the children.

Note: Not all UNICEF TV advertising clips need to be shown, nor all activities listed below need to be conducted.

Animated: Boy leaves toilet, shuts the bathroom door, walks to the table with fruit, and while he reaches for the fruit, the fruit screams. Then, green dots on the boy's hands are shown that symbolise the bacteria left on his hand when not washing his hands after using the bathroom with soap and drying with a towel.

Conduct class discussion about the link of cleaning hands after using the toilet, and what happens if this is not done. Discuss the function of water and soap. The discussion could be recorded either on the board, or in each student's exercise book.

ACTIVITY 3: UNICEF HYGIENE EDUCATION VIDEO CLIP #4

Purpose: Participate in whole class discussion about unsafe hygiene practices.

Time: Approx. 20 minutes.

Materials required: CD/DVD player, UNICEF hygiene video clip #4

Resource/ Information Sheets: N/A

Procedure

Show the UNICEF - hygiene education video clip #4 to the children.

Animated: Boy squats on sand instead of using toilet facilities. Green dots/balls symbolising bacteria can be seen spreading from the ground and contaminating well water. Issues dealt with here: Well water contamination, spreading of disease when eating with unclean hands, spreading of bacteria via flies. Last image shows mother, child and father affected by disease.

Conduct class discussion as per the issues shown. The discussion could be recorded either on the board, or in students books.

This stage can be concluded by relating the UNICEF hygiene education video clip to the tuning in activities. Summarise the main points.

Prompt the students to talk about their own experiences about beach defecation, hand washing, safe rainwater harvesting and well pollution (role play or community survey). We continue the discussion by finding out what other hygiene and sanitation issues we know about in the community.



UNICEF Video Clip #1.



UNICEF Video Clip #4.

ACTIVITY 4: GOOD, BAD AND INTERESTING IDEAS OF THE UNICEF HYGIENE EDUCATION VIDEO CLIPS

Purpose: To critically think about the hygiene practices in the UNICEF hygiene video spots.

Time: Approx. 20-25 minutes.

Materials Required: CD/DVD player, UNICEF hygiene video clips

Resource/ Information Sheets: N/A

Procedure

Ask the students to write down individually or discuss in a group the following points (plus, minus, interesting):

PMI

P= Plus: The good things about an idea- Why you like it?

M= Minus: The bad things about an idea- Why you don't like it?

I= Interesting: What you find interesting about an idea.

Introduction to PMI

The natural reaction to the issue for the students would be to either approve or disapprove the idea. The **PMI** process helps students to find good points (**P = Plus**), the bad points (**M = Minus**), and the interesting points (**I = Interesting**) about the issue they are discussing. The interesting points are neither good nor bad but are worth noticing. If the students like an issue then it is unnatural to think about the negatives or minus aspects. If the students dislike an issue it is unnatural to look for the positive or plus aspects. It is equally unnatural to look for the interesting aspects of the issue or problem if the teacher does not provide the process of PMI.

Collate a list of the results on the board, and ensure note taking. Discuss with the group:

- Why did you think the plus ideas were good?
- Why did you not like or agree with the minus ideas?
- What exactly was interesting about the interesting ideas?

Note: It is important here that the students outline the 'why' of their ideas. Some students may think that a certain idea is good, whereas others do not agree. The emphasis is on realising that there may not always be a definitive answer, and that there may be various ideas and opinions. It is important to be able to explain a view and an opinion and to listen to others.

4.3 FINDING OUT

The following activities involve students in shared experiences that provide new information about the topic and stimulate curiosity.

ACTIVITY 5: PLAN A SURVEY

Purpose: To plan and conduct a survey on common diseases in the local community.

Time: Approx. 2 hours.

Materials Required: N/A

Resource / Information Sheets

4.3 Teacher Information Sheet - List of survey questions

4.4 Teacher Information Sheet - A sample questionnaire/survey

4.5 Teacher Information Sheet - Guidelines for conducting an interview

Procedure

Organise the students into small groups and ask them to design a method of investigating the common diseases in the local community. First ask the students to devise the research questions that their investigation will seek to answer. For example:

- What are the common diseases?
- What is the extent of the different diseases in the community?
- Are the roofs used for rainwater harvesting cleaned sufficiently?
- Are rainwater tank supplies contaminated?
- Are the wells contaminated?

Students will work in two groups. They will develop 2 surveys or questionnaires to undertake; one in the community and one in health centre, or hospital.

Students and teachers sit together and prepare a questionnaire to carry out both the surveys. Refer to *Teacher Information Sheets 4.3 and 4.4* for sample survey questions and *Teacher Information Sheet 4.5* to gain ideas on how to conduct an interview.

4.4 SORTING OUT

Students at this stage will be collating, processing, analyzing and presenting the information in a variety of ways. Students will have the opportunity to further explore any questions that may have arisen when they were investigating. This would also be a good time to revisit some of the initial activities from Tuning In or Deciding Directions sections, for the students to witness how their knowledge has increased.

ACTIVITY 6: CONDUCT A SURVEY

Purpose: To collect data on common diseases in the community using questionnaires prepared in activity 5.

Time: Approx. 2 hours.

Materials Required: surveys developed in activity 5, pens, clipboards

Resource/ Information Sheets: N/A

Procedure

Students undertake the surveys. The focus should relate to the research questions. They should also draw plans to mark, for example, where toilets are located in relation to drinking water sources.

- Survey a total of 20 – 25 households
- Visit the hospital/health centre and get statistics of;
 - Most common diseases and number of patients registered with those diseases in the past 5 years
 - Ways of treating
 - Main causes
 - Awareness programmes conducted



Conducting a survey.

4.5 DRAWING CONCLUSIONS

The following activities will help students to interpret information, establish connections and confirm/reject or modify predictions.

ACTIVITY 7: SORT DATA AND DRAWING CONCLUSIONS.

Purpose: To collate data and draw conclusions on common diseases in the community.

Time: Approx. 25-30 minutes.

Materials Required: completed questionnaires from activity 6.

Resource/ Information Sheets: N/A

Procedure

Sort and analyse the data gathered. Analyse the conditions of the households that may lead to spread or cause the disease.

Students and teachers sit together and analyse the survey results. Prompt discussion using the following questions;

- What were the findings?
- How consistent are the survey findings with the issues raised in the UNICEF advertisements (hygiene education video clips)?
- Are the UNICEF advertisements relevant for this community?
- What can the community do to maintain good sanitation and hygiene, or to improve their sanitation and hygiene situation? (e.g. List down what you would do to make your drinking water safe. List down some things you would do to improve the sanitation of your island. If the water source is contaminated, what can be done? Are you happy with your own communities' toilet and sanitation situation? What would you do to improve the situation? Who is responsible for that?)
- Discuss: the possible actions that could be taken at the school and household to prevent some of the diseases.



Leaking septic tanks commonly contaminate well water in the Maldives.

4.6 CONSIDERING, PLANNING AND TAKING ACTION

As a result of students being actively involved in decision –making throughout the inquiry process, it is hoped that they will be empowered to take action which has positive personal, community and global effects.

ACTIVITY 8: RAISING AWARENESS AND EDUCATING THE COMMUNITY

Purpose: To consider, plan and take action to educate the community on common diseases.

Time: Minimum 30 minutes

Materials Required: Pen and paper, markers

Resource/ Information Sheets: N/A

Procedure

Discuss with students ways to raise awareness on this subject in your community. Some suggestions for taking action on your island include:

- Make posters and display them in the school.
- Prepare and distribute leaflets to parents.

- Perform role plays or
- Devise an educational event (an information day for the parents conducted by the students) based on their survey results.

Extension

Students could find out from other organisations such as the Unicef, World Health Organisation (WHO) or from other NGOs if they have any projects to improve hygiene and sanitation in communities.

4.7 EVALUATION AND REFLECTION

At this stage it may become evident that there is a need to return to some stages of the inquiry process to clarify knowledge or refine skills. The following questions may be asked:

- Are you happy with the ways in which your information was gathered, analysed and presented?
- Is there anything you would change?
- Are there things you need to investigate further?

ACTIVITY 9: FUTURE ACTION FOR HYGIENE AND SANITATION

Purpose: To evaluate and reflect upon the activities conducted in this section.

Time: Approx. 20 minutes

Materials Required: Pen and paper, markers

Resource/ Information Sheets: N/A

Procedure

Relate the reflections to the activities they have undertaken, the students' involvement in the community, their roles in relation to hygiene and sanitation, and whether their ideas of their roles and responsibilities have changed and encourage them to answer the following;

- What did you like about this section of the Module?
- What did you not like about this section of the Module?
- What was the most important thing that you have learnt?
- What do they see as most important to further improve hygiene and sanitation on their island and in Maldives?

ACTIVITY 10: LESSONS LEARNT

Purpose: To reflect upon and record what students have learnt.

Time: Approx. 15-20 minutes

Materials Required: Pen and paper, markers

Resource/ Information Sheets: N/A

Procedure

Ask students to write down:

- Four important ideas/concepts/information/values I have learnt in this Module are
- Two things I now want to do for myself and for others are.....

Ask students to decide what they would like to do with the results of their research and discussion. One of the possibilities might be to write a story or play about common diseases and consequences.

4.1

TEACHER INFORMATION SHEET COMMON DISEASES

Health risks from contaminated water

Well water is used by all households in the Maldives. Most communities use the well water for all non-drinking uses such as washing, bathing and toileting. Well water provides about 90% of the household water needs. Well water is therefore very important to the household.

Unfortunately, all surveys of well water show that well water is of worse quality than rainwater. It usually has about 100 times more bacteria in it and is 100 times more salty than rainwater. Some wells also contain contamination from septic tanks. Due to the presence of bacteria and other compounds from septic tank discharge it is always better to drink rainwater than well water.

If you drink well water that contains too much bacteria then it will make you sick, and give you diarrhoea and vomiting. This can lead to dehydration and for vulnerable people (children and the elderly) even death. When people get infected with diseases such as diarrhoea, typhoid and hepatitis A, their excreta will contain large amounts of the germs which cause the disease.

When people defecate in the open, flies will feed on the excreta and can carry excreta on their bodies. When they touch food excreta and germs are passed on the food. Where there are germs there is always a risk of disease. During the rainy season, excreta may be washed away by rainwater and can run into wells, thus contaminating the wells.

In many cultures it is believed that children's faeces are harmless and do not cause disease. This is not true. A child's faeces contain as many germs as an adult's, and it is very important to collect and dispose of children's faeces quickly and safely.

Many common diseases that can give diarrhoea can spread from one person to another. Disposing of excreta safely, preventing faecal contamination of water supplies and improving personal hygiene particularly hand washing with soap (at critical times such as after going to the toilet, before eating and food preparation) would greatly reduce spread of diseases significantly.

Water which is too salty will make you vomit, and may make your skin itchy and sore. Most well water in the Maldives is not too salty for drinking. Your health post may be able to

test your well for salt. People can drink salty water with a conductivity reading up to 2,500 $\mu\text{S}/\text{cm}$. (WHO guidelines suggest a maximum Chloride content of 250 mg/l for potable uses which equates to a salinity of approximately 1,500 $\mu\text{S}/\text{cm}$. However experience in other small island states confirms whilst this is desirable, a more realistic limit is 2,500 $\mu\text{S}/\text{cm}$.)

Waterborne diseases

We are often unaware of how unsafe our water supplies can be to our health. There are five broad categories of water related diseases:

- Group 1:** Water-borne infections e.g. cholera, typhoid and infective hepatitis.
- Group 2:** Water-shortage diseases e.g. skin infections, trachoma.
- Group 3:** Water-impounding diseases e.g. schistosomiasis, guinea worm.
- Group 4:** Water-arthropod diseases e.g. malaria
- Group 5:** Chemical contaminants in excess or shortage e.g. fluoride.

Some examples of water related diseases common in the Maldives

> Typhoid

Typhoid is an infection of the intestinal tract and bloodstream caused by bacteria. Clean water, hygiene, and good sanitation prevent the spread of typhoid. Contaminated water is a major reason for the spread of the disease. People become infected after eating food or drinking beverages that have been handled by a person who is infected or by drinking water that has been contaminated by sewage containing the bacteria. Typhoid is common in the Maldives, principally because of the problem of unsafe drinking-water and inadequate sewage disposal.

> Diarrhoea

Diarrhoea is the passage of loose or liquid stools more frequently than is normal for the individual. It is primarily a symptom of gastrointestinal infection. Depending on the type of infection, the diarrhoea may be watery (for example

in cholera) or passed with blood (for example in dysentery). Severe diarrhoea may be life threatening due to fluid loss in watery diarrhoea, particularly in infants and young children, the malnourished and people with impaired immunity. Diarrhoea is a symptom of infection caused by a host of bacterial, viral and parasitic organisms most of which can be spread by contaminated water. It is more common when there is a shortage of clean water for drinking, cooking and cleaning and basic hygiene is important in prevention. Water contaminated with human faeces for example from municipal sewage, septic tanks and latrines is of special concern. Diarrhoea can also spread from person to person, aggravated by poor personal hygiene. Water can contaminate food during irrigation, and fish and seafood from polluted water may also contribute to the disease.

For the reduction of diarrhoea, proper sanitation facilities have to be used. Another aspect that should be looked at is, food safety and personal hygiene. (Health Master Plan 1996 – 2005)

> Cholera

Cholera (also called Asiatic cholera) is a water-borne disease caused by the bacterium *Vibrio cholerae*, which is typically ingested by drinking contaminated water, or by eating improperly cooked fish, especially shellfish. The infection is often mild or without symptoms, but sometimes it can be severe. It has a short incubation period, from less than one day to five days, and produces an enterotoxin that causes a copious, painless, watery diarrhoea that can quickly lead to severe dehydration. Approximately one in 20 infected persons has severe disease characterized by profuse watery diarrhoea, vomiting, and leg cramps. In these persons, rapid loss of body fluids leads to dehydration and shock. Without treatment, death can occur within hours.

Most persons infected with *V. cholerae* do not become ill, although the bacterium is present in their faeces for 7-14 days. When illness does occur, more than 90% of episodes are of mild or moderate severity and are difficult to distinguish clinically from other types of acute diarrhoea. Less than 10% of ill persons develop typical cholera with signs of moderate or severe dehydration.

> Hepatitis A

Hepatitis A is an enterovirus and can be transmitted through contaminated food and water. It causes an acute form of hepatitis (inflammation of the liver), does not have a chronic stage, and will not cause any permanent damage to the liver. Young children who catch hepatitis A often have a milder form of the disease, usually lasting from 1-3 weeks, whereas



Mosquitoes like to breed in areas where there is stagnant water.



adults tend to experience a much more severe form of the disease. They are often confined to bed and minimal activity for about 4 weeks and have to stop their work for one to three months or longer. Many adults take up to 6-12 months and occasionally longer to recover entirely.

> Skin problems

There can also be skin problems due to high salinity levels.

> Worm infestations

Worm infestations are an area of concern. Intestinal parasite not only result in diarrhoea but may also be one of the causes of the high level of anaemia in the country. A survey conducted in 1992, showed that in Laamu Atoll, 68% of children under 3 years of age were suffering from worm infestations. This was mostly ascaris, trichuris and hookworms. Recent estimates indicate 50-75% of children below 5 years of age to be affected by intestinal parasites.

To combat the high worm infestation existing in the country, there have been recent efforts at providing children with worm treatment. In faafu, Laamu and Vaavu atolls, all

children under five were provided with worm treatment. While this form of intervention does temporarily improve the situation, unless the sanitation situation is improved, hand in hand with mass deworming, there will not be a significant reduction in worm infestation, as those who carry worms in their system will expel them in their faeces, and these get ingested through contaminated food and water, infecting others and thereby continuing the cycle.

The programmes implemented for the control of worm infestations have relied mainly on the deworming of children below 5 or 3 years of age. While this alleviates the problem to some extent, the lack of adequate attention to sanitation and also education in the area of personal hygiene means the situation will not be sustained. Future interventions should, therefore, integrate deworming with the provision of sanitation facilities and must go hand in hand with effective education. (Health Master Plan 1996 – 2005)

Diseases spread by mosquitoes

Mosquitoes are a nuisance in most islands. This also gives way to the breeding of mosquitoes transmitting dengue and other diseases. There are several islands where the mosquito population is so dense that it is impossible to stay outdoors after it is dark. An integrated approach to mosquito control combining chemical, biological and environmental

strategies need to be implemented in a phased manner to eliminate mosquito breeding in at least those islands where the mosquito density is extremely high. (Health Master Plan, 1996 – 2005).

> Dengue Fever

Dengue is the most common mosquito-borne viral disease of humans that in recent years has become a major international public health concern. Globally, 2.5 billion people live in areas where dengue viruses can be transmitted.

Dengue fever is endemic in the Maldives, though no clear-cut epidemic pattern has been identified. *Aedes aegypti* and *Aedes albopictus*, the main vectors for the disease, are widespread in the country. The first cases of dengue were identified in 1979. Following this, in 1988 a major epidemic of dengue hemorrhagic fever occurred with more than 200 cases and 9 deaths. Since then there have been no major outbreaks, although sporadic cases have been reported. However, in the last three to four years dengue fever (DF) and dengue haemorrhagic fever (DHF) has been notified. In 2003, 38 cases of DF/DHF were reported and in year 2002, 27 cases of DF/DHF were notified compared to 180 and 73 cases in 2000 and 2001 respectively. There is a consistency seen in the incidence of DF/DHF where the highest incidence rates are seen during the months of June



Many diseases are spread by mosquitoes. Try to avoid being bitten.

and July where the country experience monsoonal rains. On average, 17 cases of DF/DHF were reported in June during the 2000-2003 period and about 11 cases were reported in May and July during the same period.

Quick facts about Dengue fever

Dengue is a flu-like viral disease spread by the bite of infected mosquitoes. Dengue hemorrhagic fever is a severe, often fatal, complication of dengue.

Prevention from Dengue centres on avoiding mosquito bites in areas where dengue occurs or might occur and eliminating breeding sites.

The mosquitoes that transmit dengue live among humans and breed in discarded tires, flower pots, old oil drums, and water storage containers close to human dwellings. Unlike the mosquitoes that cause malaria, dengue mosquitoes bite during the day.

Dengue fever usually starts suddenly with a high fever, rash, severe headache, pain behind the eyes, and muscle and joint pain. The severity of the joint pain has given dengue the name "breakbone fever." Nausea, vomiting, and loss of appetite are common.

Most dengue infections result in relatively mild illness, but some can progress to dengue hemorrhagic fever. With dengue hemorrhagic fever, the blood vessels start to leak and cause bleeding from the nose, mouth, and gums. Bruising can be a sign of bleeding inside the body. Without prompt treatment, the blood vessels can collapse, causing shock (dengue shock syndrome). Dengue hemorrhagic fever is fatal in about 5 percent of cases, mostly among children and young adults.

There is no specific treatment for dengue. Persons with dengue fever should rest and drink plenty of fluids. They should be kept away from mosquitoes for the protection of others. Dengue hemorrhagic fever is treated by replacing lost fluids. Some patients need transfusions to control bleeding.



Mosquitoes can breed in many types of containers that hold water, such as a tyre.

> Chikungunya

Chikungunya is a virus spread by mosquitoes. The symptoms of Chikungunya (also called as Chicken Guinea) include fever which can reach 39°C, (102.2 °F) a petechial rash usually involving the limbs and trunk, and arthralgia or arthritis affecting multiple joints which can be unbearable. There can also be headache, conjunctival infection and slight photophobia. Fever typically lasts for two days and abruptly comes down, however joint pain, intense headache, insomnia and an extreme degree of prostration lasts for a variable period.

The mosquito species that transmits the Chikungunya virus is the *Aedes albopictus*, commonly known as the Asian tiger mosquito or forest mosquito. There being no vaccine or preventive drug for chikungunya at present, the best way to avoid the infection is to control the mosquito population in the island and prevent mosquito bites.

References:

<http://en.wikipedia.org/wiki/chikungunya>

Ministry of Health, The Maldives Health Report 2004, Maldives.

Ministry of Health, Health Master Plan 1996 - 2015, Maldives.

Ministry of Health, Health Master Plan 2006 - 2005, Maldives.

4.2

TEACHER INFORMATION SHEET PREPARATION TO USE UNICEF HYGIENE AND SANITATION TV ADVERTISING CLIPS

Please familiarise yourself with the UNICEF hygiene and sanitation TV advertising clips. You can choose to use any number of them within this Module. It is recommended to use them in the following order:

1. Animated. Boy leaves toilet, shuts the bathroom door, walks to the table with fruit, and while he reaches for the fruit, the fruit screams. Then, green dots on the boy's hands are shown that symbolise the bacteria left on his hand when not washing his hands after using the bathroom with soap and drying with a towel.
2. Actors not animated. Father leaves the bathroom, sits down at the table and wants to eat. Son stops father with magnifying glass and looks at the father's hand. Animated black spots on the father's thumb symbolise the bacteria that are left when he does not wash his hands with soap and dry them with a towel after using the bathroom (although bacteria cannot be seen with a magnifying glass in reality).
3. Animated. Boy squats on beach instead of using toilet facilities, bird falls out of the sky dead due to bad smell. Next, boy is seen using toilet facilities.
4. Animated: Boy squats on sand instead of using toilet facilities. Green dots/balls symbolising bacteria can be seen spreading from the ground and contaminate well water. Issues dealt with here: Well water contamination, spreading of disease when eating with unclean hands, spreading of bacteria via flies. Last image shows mother, child and father affected by disease.



UNICEF Video Clip #1.



UNICEF Video Clip #2.



UNICEF Video Clip #3.



UNICEF Video Clip #4.

4.3

TEACHER INFORMATION SHEET LIST OF SURVEY QUESTIONS

These are sample issues and questions for the teacher to help the students devise a questionnaire sheet.

Include on survey sheet name of the house, and name of interviewers.

Drinking water – rainwater, well water

1. Which water source do you use for drinking?
Well water / Rain water / desalinated / bottled
2. How do you store drinking water?
3. How do you collect rainwater if you drink rainwater?
4. Does your household have a private household rain water tank?
Concrete / HDPE / Capacity of tank (litres)
5. Do you ever run out of rain water? Months/Never
6. What purposes do you use rainwater for? Cooking/
Drinking
7. Where do you source alternative drinking water supply from?
Mosque well / Communal tanks / Other
8. Who is responsible for collection of rain water?
9. Is the rain water tank clean?
 - The area surrounding rain water tank is clean
 - The roof and gutters are clean
 - Top of the tank is clean
 - There are no overhanging branches over the roof
 - The rainwater tank is covered
 - First rains flushed by not connecting to tank. Yes No
10. How often do you clean the roofs for rainwater collection?

Septic

11. Is there a sewer system on the island? Yes/No
12. What sanitation facilities do you use?
 - Toilet
 - Beach

13. What is the distance of well from septic tank?
Distance in metres / More than 15 metres apart
14. Is there a septic tank in the household compound.
(Yes / No)
15. How do you dispose of the septic waste?
In the household compound / Through pipes going to the sea
16. Do you clean your septic tank on a regular basis? Yes/
No
17. Where do you dispose of the septic waste?
Household compound / sea / waste management centre
18. Are there any signs which may lead to ground water contamination?
 - Area surrounding the well is clean
 - There are no unpleasant odours in the area surrounding the well
 - The well is covered
 - There are no cracks in the well
 - There are no cracks on the concrete platform adjacent to the well
 - There are no signs of waste near the well
19. Are there any problems with the well water? (if the answer is Yes, define the problem)
bad smell / bad taste / colour / other

Hygiene

20. Is there soap?
In the toilet / In the dining room / In the kitchen?
21. Did anyone in the household have diarrhoea?
22. What was the cause of it? Number of people / Age(s)
23. Rate the cleanliness of the household
Very clean / Clean / Not Clean

4.4

TEACHER INFORMATION SHEET A SAMPLE QUESTIONNAIRE/SURVEY

Name of the house:

Name of the interviewers:

What kind of water is used for drinking? Is it rainwater, well water (ground water), desalinated water or bottled water?

How do you store drinking water?

How do you collect rainwater if you drink rainwater?

How often do you clean the roofs for rainwater collection?

Do you ever run out of rainwater? If so for how long?

What alternative supply of drinking water do you use if rainwater runs out?

Is your well water contaminated? If so, how do you know?

Has anyone in your house suffered from health problems such as diarrhoea caused by contaminated water?
Please provide details.

4.5

TEACHER INFORMATION SHEET GUIDELINES FOR CONDUCTING AN INTERVIEW

Preparation

- Make sure the purpose of your interview is clear.
- Make a short list of questions (four or five are enough) to guide the interview.

Introduction

- Always introduce yourself at the start of the interview.
- State clearly the purpose of your interview.
- Ask the respondent if he or she has time to discuss the topic with you at this moment or to suggest another time that is convenient.
- Explain that your conversation will be confidential.

Conducting the Interview

- Begin with some friendly general conversation to help the person feel at ease.
- Then ask a question which is easy for the respondent to answer. Do not begin with a personal question, it may cause offence and stop the free flow of information.
- Only express one idea in each question to avoid confusing the respondent.
- Avoid questions where the respondent only needs to answer yes or no because that can stop the flow of information
- Beware of asking questions that try to influence the respondent's answers. For example, never ask "Don't you think that ..."? This is called a leading question.
- Avoid using negative questions such as "Do you think that people should not..."? These questions can confuse the respondent.
- Be sure that you have clearly understood the answer. If not, ask the respondent to repeat the answer. Always ask the respondent to explain words and ideas that you do not fully understand. Do not assume that you know what the answer is because of your own knowledge and experience.
- Avoid passing judgment, giving advice or your own opinion.
- Tell the respondent when you are going to change the topic so that the respondent can be prepared.



Conducting an interview.

- Avoid discussions that are not useful. Keep to the topic of the interview.
- Watch your body language as it tells the respondent what you are feeling and can help or disturb the interview.

Closing the Interview

- Keep the interview short.
- Summarise the main points as you have understood them and ask the respondent if your summary correctly reflects what was said.
- Ask the respondent if there are any questions he or she would like to ask you.
- Thank the person for their time.

Guidelines for Recording an Interview

- Record the detail of what is said.
- Record observations and how the interview went.
- Record who said what and whether others agreed.
- Make follow-up notes after the interview with the observer.
- Record personal impressions.

GLOSSARY

Archipelago

A group or chain of islands.

Biodiversity

The variety of life on earth.

Contaminated

Polluted or poisoned because of contact with harmful substances.

Culture

The beliefs, customs, practices, and social behavior of a particular nation or people

Disease

An abnormal condition of an organism that negatively affects normal bodily functions.

Ecological Footprint

The impact or impression that each person makes on the Earth. Each person's footprint is different and is related to the way we live our lives.

Ecosystem

A community of plants, animals and micro-organisms that are linked and that interact with each other and with the physical environment.

Endangered

Threatened with extinction, as a species of plant or animal; to have put in a dangerous situation.

Environment

Everything that surrounds a living thing and affects its growth and health.

Environmental Impact Assessment

The process of identifying the potential impacts of a development, the effect of these impacts and alternatives to the development.

Environmental Impact Statement

A report that is prepared by the person or company that wants to carry out a development project and is given to the environmental agency within the government.

Habitat

The area where an animal, plant or micro-organism, lives and finds the nutrients, water, sunlight, shelter and other essential needs for survival.

Indigenous

Belonging to a place: originating in and living in a region or country.

Livelihoods

Job, work, or source of income.

Nature

The natural world as it exists without human beings.

Photosynthesis

The process by which green plants or algae use sunlight to produce carbohydrates (starch). Oxygen is released as a by-product of photosynthesis.

Preserve

To keep alive for the benefit of all.

Reclamation

To fill an area with soil, sand or debris to gain land.

Resource

Natural or human made material that can be used by people (e.g. wood or steel)

Sanitation

The study and maintenance of public health and hygiene, especially the water supply, solid waste and sewage systems.

Sediment

Material which settles out of a liquid to form a layer.

Sewage

Fluid containing water borne, domestic and human waste.

Species

A group of organisms that has a unique set of characteristics that distinguishes them from other organisms.

Sustainability

Meeting the needs of the present generation without diminishing the ability of people, other species or future generations to survive.

Traditional Knowledge

Local knowledge that has been gained over many years after close contact with the environment.

Reference definitions sourced from <http://encarta.msn.com/dictionary>

All kids are gifted,
some just open their packages earlier