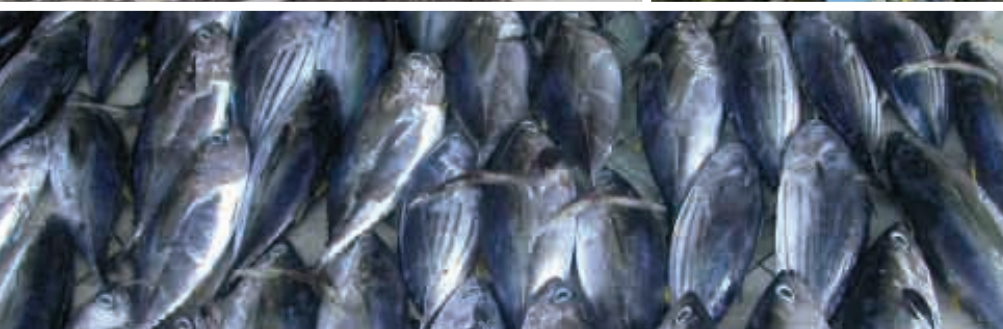




A RAPID ASSESSMENT OF PERCEPTIONS INTO ENVIRONMENTAL MANAGEMENT IN THE MALDIVES VOLUME 1

Environmental Education and
Community Mobilisation



Prepared for the Ministry of Environment, Energy & Water
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ABBREVIATIONS

ADB Asian Development Bank

CSP Country Strategy Program

EE Environmental Education

IDC Island Development Committee

MWSA Maldives Water and Sanitation Authority

MDGs Millennium Development Goals

MEEW Ministry of Environment Energy
and Water

MOFT Ministry of Finance and Treasury

MPND Ministry of Planning and National
Development

NERRPO National Economic Recovery and
Reconstruction Program Office

O&M Operations & Management

NEAP National Environmental Action Plan

NBSAP National Biodiversity
Strategy & Action Plan

PCC Project Coordination Committee

PHAST Participatory Hygiene and Sanitation
Transformation

RAP Rapid Assessment of Perceptions

SOE State of the Environment

TA Technical Assistance

TEAP Tsunami Emergency Assistance Project

WB World Bank

WDC Women's Development Committees

WHO World Health Organisation

WIA Whole Islands Approach

WSS Water Supply and Sanitation

UN United Nations

UNEP United Nations Environment Programme

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This report, tailored to support the government of the Maldives in advancing sound environmental management, was developed with assistance and support from many organisations, communities, government departments and individuals in the Maldives. The principal authors were Jady Smith and Christian Nielsen working in collaboration with Fathimath Shafeega, Zameela Ahmed and Robbie Henderson. This work was financially supported by the Asian Development Bank.

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ



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 Ministry of Environment, Energy and Water

Environment governance is an integral part of sustainable development – recognising the fact the government accords top priority for safeguarding natural resources, not only for the present generations but for those of the future as well. Therefore, long-term sound environmental planning and management, with stakeholder participation, community consultation and sustained education and awareness campaigns are required. The government remains strongly committed to advancing environmental education through formal and non-formal education and to providing children, youth, community members and leaders with the knowledge and skills to govern natural resources.

In this regard, I wish to congratulate Live & Learn environmental Education team for producing this useful document entitled “A Rapid Assessment of Perceptions of Sound Environmental Management in the Aftermath of the Tsunami Disaster” with the kind assistance of the Asian Development Bank. I have no doubt that this document will serve as a vehicle for enhancing the role of environmental education in the Maldives and provide guidance on the development of education approaches that have high and meaningful impact. This document clearly highlights the need to engage all groups of society in environmental management; a process that can only occur when people have a true understanding of the environment and its interaction with social and economic dynamics. This is the first of two documents that will assist in heightening this understanding.

Abdullahi Majeed

Deputy Minister
 Ministry of Environment Energy and Water

Communities are most concerned about water, waste, beach erosion and health



This report is designed to provide a basis for the development of environmental education tools and methodologies for environmental management that are both effective and appropriate to the expectations and context of the beneficiaries. The findings from this Rapid Assessment of Perceptions (RAP) are numerous and reflective of the many challenges facing a small island state. The knowledge of environmental issues within the community was high and participants had good awareness of the links between social, economic and environmental issues. However, awareness alone will not lead to change: there is an apparent lack of the social/economic skills needed to act, coupled with poor understanding of alternative options. The general focus of environmental education in the past has been within the biophysical paradigm, exploring environmental linkages and some 'cause and effect' theories.

While this paradigm is important and relevant, attention needs to be paid to the social and economic processes that mediate environmental sustainability, especially in the area of water governance.

The RAP identified five defined areas where environmental management could be strengthened: (i) strengthening capacity for safeguarding and monitoring of water resources, (ii) cultivating domestic expertise in participative facilitation techniques, (iii) focusing on and understanding local needs and exciting skills and knowledge and (iv) promoting of individual and community reflective activities. Part IV of the report brings forward the scope, principles and methodologies to advance sound environmental management through education and learning.

KEY FINDINGS

- 1: Communities are most concerned about water, waste, beach erosion and health.
- 2: There is variation in community willingness to participate in environmental activities between islands.
- 3: The community perceives that water pollution poses public health and environmental hazards, leading to a deterioration of quality of life.
- 4: There is interest in alternatives for water supply & waste management:
- 5: Youth groups and Women's Development Committees appear most active on environmental issues (no specific men's groups were identified).
- 6: Whilst communities have some knowledge about the environment, values differ, and they lack the power and technical knowledge of alternatives to deal with environmental issues.
- 7: Community leaders considered it important to try to deal with environmental issues themselves, but government agencies were ranked highly in regard to making decisions about the environment.
- 8: Communities have communal use of environmental resources with water historically considered in a communal way.
- 9: A common belief was that increased awareness could play a role in better local environmental management; however, a reluctance to discuss behaviours that impact the environment was also demonstrated.
- 10: Teachers perceived that there were opportunities for teaching about environmental management but also felt there were not enough resources to do this effectively.

Major environmental management issues identified by the government include: climate change, scarcity and pollution of freshwater resources, waste management, air pollution, and biodiversity conservation. The communities researched were most concerned about the pollution of the island's ground water, particularly around their wells, and believed that this pollution diminished their quality of life by impacting on their general health. However, many appeared to lack understanding of alternatives or possess the social/economic skills needed to act on this awareness.

Upward attention needs to be given to the link between family level micro-economics and environmental conditions. Attention must also be paid to the complexity of human interactions with the environment, including the economic, political, cultural and social systems in which people operate, as well as the natural systems. Consequently, to maximise the impact and potential of environmental education, the tools and methodologies chosen will need to recognise this, need to be more action oriented and also tap into the local economy to make environmental concerns a priority.

Environmental change is most likely to occur if environmental education supports existing community activities, in particular, income generation. Likewise, individual change agents should be drawn from existing interested parties such as schools, health centres and village elders along with utilisation of the various semi-government community based organisations such as the women's development centres and youth clubs.

Religion plays a major part in daily life and has a significant role in the formation of individual attitudes towards key issues such as education, health and the environment. Innovative approaches that respect traditional, cultural and religious knowledge will make it easier for participants to cope with perceived risks involved



with behaviour change. The role of mosques as communal water sites increases their potential in supporting environmental education by linking it to people's spiritual learning and their sense of relationship with the environment.

There is a need for emphasis on visual tools as, even though the literacy rate is high, there is not a strong culture of reading with most people preferring to watch television. Although posters and billboards are common in the Maldives, few promote the environment. Whilst these media may initially seem readily acceptable through their commonality, people were not enthusiastic about getting more posters and therefore alternative visual modes need to be investigated.

Opportunities exist for television and radio documentaries. To relieve the pressure on already overworked teachers, and streamline the time it would take to train more teachers, it is clear that television or radio broadcasts used as part of their curriculum may be advantageous. Opportunities also exist for utilising traditional dance and theatre. It is important that such approaches are used as a complementary addition to other effective face-to-face education approaches.

The principles of waste management are based around the tenets of reduce, reuse, recycle. The Japan International Cooperation Agency 1999 study on solid waste management projected that household wastes in the Maldives will comprise 75% organic waste. With this in mind, composting will be one of the most innovative significant approaches that can be made toward waste management; significantly reducing the quantity of waste by removing organics from the waste stream, promoting the reuse of organic matter in the form of natural fertiliser and mulch for creation of nutrient rich soil for home gardens and agricultural plots, and reducing the use of chemical fertilisers that can impact on the groundwater.

Communities have many other focuses and post-tsunami pilot programs in operation. Active participation of communities in the development process of solving community-based problems is a prerequisite for durable and effective environmental education.



The islands are predominantly coastal entities,
and their ecosystems are among the most
vulnerable in the world



THE MALDIVES

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 of these house tourist resorts. The islands are predominantly coastal entities, and their ecosystems are among the most vulnerable in the world. The Maldives have a narrow economic base that relies on two critical sectors, tourism and fisheries. As these sectors form the main source of employment and livelihood, protecting the Maldives' fragile coral reefs and coasts, fisheries and the marine environment from pollutants is central to any poverty strategy. Unique geography and vulnerability pose 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.

Impacts resulting from the absence of basic infrastructure and social services in the atolls were further exacerbated by the damage that followed the high waves and flooding of the Indian Ocean tsunami which hit the Maldives on 26 December 2004, leading in some cases to absolute destruction of existing infrastructure. Waste disposal sites on most tsunami-affected islands were destroyed and waste previously collected was spread throughout the islands, putting public health at risk and the groundwater lens at risk of contamination from leaching of pollutants. The freshwater lens is also endangered by potential contamination

from spilled oil, salt intrusion and sewage from fractured waste networks or damaged septic tanks. The natural disaster could lead to a number of environmental and public health concerns -- while water supply channels and basic sanitation services are in urgent need of reconstruction and/or development, the need to expedite adequate solid waste management practices and structuring the sector for efficient operation have emerged to be critical at this stage.

“In the aftermath of the December 26th tsunami, the spirit of cooperation and unity that we saw across the country was one of its key strengths on the road to recovery and reconstruction.”

MAUMOON ABDUL GAYOOM, President, the Republic Of Maldives. Millennium Development Goals Maldives Country Report 2005

The international community has responded generously to the tsunami disaster, which in turn has led to the formulation of a large number of projects in several sectors (water supply and sanitation, health, housing, transport and power, amongst others). Institutionally, it is challenging to get projects implemented due to the lack of professional expertise in the Ministry of Environment, Energy & Water (MEEW) and the increasing number of projects. The role of the communities should be further enhanced throughout the rehabilitation and reconstruction process. To facilitate this, communities must be organised and their awareness increased. Although capacity-building activities have been undertaken in the Maldives in the past, these activities have mostly concentrated on hygiene

education rather than on inclusive environmental health and management programs that would take into account local livelihoods and practices and the overall cultural context.

Such an inclusive environmental health and management program is required as a means to develop widespread understanding of the interdependence and fragility of ecological systems and the natural resource base on which human well-being is dependent. Environmental education can lead to the adoption of new behaviours in the protection of water and natural resources essential for human development in the islands. In addition, education and knowledge would provide communities with better coping mechanisms and self-help strategies in the face of new disasters.

Community fabric and the significance of local social capital have become more evident in the aftermath of the tsunami, as communities confront island recovery and reconstruction activities in a way that is consistent with their self-identified needs and development plans. For a number of years, the government has promoted community participation in the delivery of public services to empower atoll communities, increase accountability and ownership. Community groups often provide public or collective services available on distant islands; however, some initial capacity difficulties have been encountered which could be overcome through assistance for adequate organisation and management of groups in the form of co-operatives.



Findings derived from the implementation of projects related to natural disasters have highlighted: (i) the need to integrate recovery and long-term development planning, (ii) the need to identify development outputs that meet sustainability requirements, and (iii) the necessity to link infrastructure development efforts with capacity building and institutional development. Thus, the emerging necessity to develop the community's capacity to enable its participation through the design, implementation and management of environmental infrastructure and services, and expediting recovery of affected islands.

Until the late 1970s and early 80s government administrative and notably development planning was centralised in Male', the capital city. Consequently, development became lopsided between the outer islands and Male' with development activities being focused on Male' to the detriment of outer islands development. To reverse this adverse situation in the country's development, the Government embarked on the Integrated Atoll Development Program in the early 1980s within the general concept of decentralisation of government administrative machinery. This is to accelerate equitable allocation of the country's benefits of growth and development, through the provision basic physical and social infrastructure of development and to raise the standard of living and wellbeing of the atolls population. (UNDP MDV/00/002)

LIVELIHOODS IN THE MALDIVES

Tourism, fishing and agriculture are all significant income generating sectors in the Maldives. The tsunami has highlighted the vulnerability of these 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 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 intrusion, 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.

ENVIRONMENTAL MANAGEMENT IN THE MALDIVES

The Ministry of Environment, Energy & Water regularly publishes a State of the Environment (SOE) report to assess the issues and development of the environment. At the time of writing the 2005 SOE serves as the most current Government document summarising environmental issues in the Maldives. This SOE report states that the National Environmental Action Plan (NEAP) encompasses the environmental protection policy for the Maldives. The first NEAP was developed in 1989, and addresses environmental planning and management needs for the country with the aim being to protect and preserve the environment of the Maldives and to promote sustainable management of its resources for the collective benefit and enjoyment of present and future generations. The NEAP is further supported in policy by the National Legal Framework for Environmental Protection and the Environment Protection and Preservation Act (EPPA 1993), which includes regulations and policies to protect and preserve the natural



environment and resources, and through clause 10 gives the government of the Maldives the right to claim compensation for all damages caused by activities that are detrimental to the environment. The National Legal Framework for Environmental Protection states that it is compulsory to undertake an Environmental Impact Assessment (EIA) for all development activities, thereby helping to integrate environmental considerations into the decision making process.

Sustainable development is a priority of the government. Documents such as the National Biodiversity Strategy and Action Plan, State of Environment and Millennium Development Goals, highlight the need for national approaches to environmental management. Unfortunately, sustainable development and environmental issues are not given a high profile in the government's national planning document. As such, it is one of the major challenges to environmental management & education in the Maldives. With the new Ministry of Environment, Energy & Water (MEEW), the impetus for environmental management across the Maldives should be more coordinated. The influx of environmental projects and continuing growth of tourism and corresponding EIAs has placed a heavy workload on the ministries staff. MEEW is currently recruiting new staff to deal with the workload; however it will take some time to develop their capacity.

The SOE and NEAP both highlight five key environmental issues for the Maldives:

1. **Climate change and sea level rise:** "The vulnerability to climate change and sea level rise is revealed through the indicators obtained from the SOE survey."
2. **Fresh water resources:** "Accessing safe drinking water is a major limitation faced by the people of the Maldives."
3. **Waste management:** "Solid and hazardous waste management has recently emerged as one of the greatest environmental challenges in the Maldives."
4. **Air pollution:** "An increasing trend with air pollution reaching levels of concern."
5. **Biodiversity conservation:** "In the Maldives the population is reliant in one way or another on the coastal resources."

The tsunami on 26 December 2004 brought an increased national and international focus on environmental management initiatives in and around the Maldives. A number of organisations have sought to assist the government of the Maldives with environmental assessment in different areas. The United Nations Environment Program (UNEP) conducted the most general and comprehensive of these assessments. UNEP conducted a 'Post-Tsunami Environmental Assessment' of the Maldives. This report emphasises that the impacts of the Tsunami on the environment were 'profound' but also highlights that the post-tsunami attention has:

Brought to light the many urgent environmental problems that existed prior to the tsunami in such areas as waste management, sanitation, protection and recovery of groundwater resources, and coastal zone protection. (UNEP 2005)

UNEP identified a number of limitations in current environmental management practices in and around the Maldives including an inadequate level of pre or post-tsunami data on the Maldives environment, and a general lack of environmental monitoring and reporting at atoll or island level. These limitations are indicators of the inadequate environmental management that was in place prior to the tsunami, however now that these inadequacies have been highlighted, the government is actively seeking to remedy the limitations and promote greater environmental management.

The UNEP report highlights a range of organisations that have been involved in a variety of areas related to post-tsunami environmental management in the Maldives including:

- Australian Agency for International Development studied the tsunami's impact on **coral reefs**
- USGS (in cooperation with the US Agency for International Development, the Japanese Society of Civil Engineers/Japan International Cooperation Agency (JICA), a coalition of Australian universities and the International Oceans Commission have conducted **geological, geomorphologic and vulnerability assessments**
- United Nations Children's Fund, ADB, Oxfam, the International Federation of Red Cross and Red Crescent Societies (IFRC), the US Army and the Governments of UK, Norway and Germany ran **emergency water and/or sanitation relief programs**, (IFRC and UNICEF have continued these activities into the recovery phase)
- IFRC is planning to implement a UNEP-initiated tsunami **waste clean-up** project
- The ADB and JICA have both implemented projects in the area of solid waste management
- WHO has focused on **health care, waste management and environment and health issues**
- The United Nations Development Program (UNDP), with assistance of UN Volunteers, is promoting **sustainable approaches** to disaster risk reduction, shelter, livelihoods and coordination activities and is providing ongoing technical and project-related assistance to the MEC
- The Food and Agriculture Organisation (FAO) has investigated **soil and groundwater** conditions while providing assistance to the agricultural and fisheries sectors

Communities already have communal use of environmental resources. Water has historically been a resource that is considered in a communal way, with communal wells available at mosques, government offices and even private houses. There are forms of communal management of resources in the Maldives, these may serve as starting points for community mobilisation for environmental management. Traditional knowledge existing

in the different communities needs to be explored and documented. For example, the traditional knowledge, once highly appreciated, of using herbs as medicine is losing its value and prominence in the respective communities and has not been transferred to the younger generations. The traditional folk stories and skills of the main occupation, fishing and subsistence agriculture are also being replaced by new and sometimes less sustainable approaches.

It is timely for the government to move toward increased environmental management and this may be assisted by the external inputs of donors in the post-tsunami setting. It is important to now move beyond emergency responses to environmental management and toward longer-term environmental management for the environmental and economic sustainability of the Maldives.

EDUCATION IN THE MALDIVES

The Maldives invests more than 20% of its GDP in social services. Quality education, elimination of educational disparity and decentralisation of educational services is the main educational policy of the government that all sectors are trying to achieve. The result is that the country has achieved universal access to primary education and is well on its way to achieve universal secondary education. Government policy ensures that all islands offer primary education up-to Grade 7. Enrolment for the seven years of primary education was over 99% by the year 2000.

The government provides most of the lower education and all upper secondary education. The government supports community schools and provides teachers at a 35:1 student teacher ratio. (Ministry of Education, 2004). Opportunities to access secondary education are much more restricted than primary education. Thus, educational awareness and people's expectations for secondary education have increased in the atolls.

Net enrolment in primary school grades 1 – 5 is 99%, while in the 5 – 17 age groups 86% are currently attending school, with 4% having never attended school or dropped out from the education system. Data on education, even though indicating almost universal literacy rates (98%) among the adult population, shows that the drop out rate is high and the average number of years children attend school is considerably low.

TABLE 1: SCHOOL ENROLMENT TRENDS BY LEVEL 2001 TO 2004

LEVEL	2000	2001	2002	2003	2004
Pre-primary	12 894	12 809	12 886	11 206	13 075
Primary 1-7	73 522	71 054	68 242	66 169	6330
Secondary 8-10	18 254	21 644	11 247	25 486	26 141
Secondary 11-12	638	824	1131	1481	1622

Source; (Ministry of Education 2004)

Approximately two-thirds of children aged 3 – 5 years are attending some form of organised early childhood education. The high dropout rates from primary and secondary education and the overall low level of education in the population highlight the importance to focus on reducing dropout rates. Enhancing the facility of early childhood education would play a part in the reduction of dropout rates in the future.

Non-government institutions provide pre-school education in Male'. The government supports the pre-schools in Male' by providing teachers and bearing other administrative costs. In the atolls, the pre-schools are run solely by private organisations. The result is a considerable regional disparity of quantity and quality of provision of education at this level. The government cannot afford to provide teachers for all the preschools in the Maldives. The government would support the training of preschool teachers and the development of the curriculum and the teaching learning materials. (Education Master Plan, 2004)

The teaching and learning processes in the schools, even in the early primary grades, are exam driven. The schools conduct their own examinations until year 10 when the students sit a national exam in Dhivehi and Islam and an international exam (Cambridge GCSE). A lot of pressure is imposed on the schools to 'prepare' students for the external examination they sit at the end of year 10. Attaining good results in the GCSE is a highly regarded achievement. Commendable results turn out to be passports to obtain entry into tertiary institutions (internal and external / international). This trend has a direct impact on the teaching methodology used by teachers. Much emphasis is put on 'rote' learning. Activities based learning, which promotes concrete learning experiences, is seldom used.

The Maldives College of Higher education and some private institutions provide tertiary level education. Tertiary institutions offer courses ranging from certificate and diploma to post graduate levels courses in a range of disciplines. There is a strong campaign to train more Maldivian teachers as at present the Maldives has a shortage of trained local teachers, especially in the secondary schools. Expatriate teachers working in the schools make up 18.6% of all expatriates working in the country. The expatriate teachers are employed to teach specific subjects such as English and other specialist subjects (sciences and social studies). There are major drawbacks in employing expatriate teachers in the schools. One is that the cost of hiring an expatriate teacher can be double the cost of a hiring a Maldivian equivalent. Second is the inability of the teachers to teach subjects like social studies and science efficiently (using a local context that enables children to use the knowledge gained practically).

Education and information influence the extent to which available resources in a household are used for nourishment, psychosocial development, hygiene, sanitation and other practices. Adult literacy rates are high, but access to information is limited, particularly in the atolls, resulting in low awareness on important issues such as health, hygiene, nutrition and childcare (Ministry of Health, 2001). Parents value formal education and sending their children to school is seen as an achievement. The texts given to school students are widely used as reading for pleasure by the parents and the elders in all the communities.

Thus, textbooks could be a very helpful tool to convey messages on environmental issues to the general public, especially where library resources are scarce and reading materials such as local newspapers are not accessible. The Environment

and Social Studies curriculum that is offered in primary and middle schools in the Maldives covers a variety of disciplines without necessarily focusing on educating students on managing the local environment. Environment and Social Studies focuses on the study of human behaviour and how people have organised themselves into societies over time and interacted with their physical environments. This curriculum could be adapted to include concepts including the local environment and to integrate the areas that have been streamlined into different disciplines, using a whole school approach to deal with issues of environmental sustainability.

Environment Studies and Social Studies are taught in English although participants in the teacher effectiveness study conducted by the Faculty of Education in 2004 (unpublished) reported that “subjects like Environmental Studies were not easily taught in English, with some environmental studies concepts better explained in Dhivehi Language in the school, “...as the English standard is very weak, they cannot understand most of the concepts.” Instructional bilingualism may seem the obvious solution to this problem, but teachers’ own limited English skills may not allow them to switch comfortably back and forth between English and Dhivehi.

According to the RAP, teachers also felt that more local environment management concepts should be integrated into the Environment and Social

Studies curricula. The formal environmental and social studies curricula need to be localised and flexible to the different local environments and communities and should emphasise the need to focus on participatory approaches. However, the teachers are not very well equipped or resourced to conduct the activities.

ENVIRONMENTAL EDUCATION IN THE MALDIVES

Environmental education does not have a high profile or usage amongst the government departments or organisations in the Maldives. Its future use should be expected to grow over time, especially with the greater post-tsunami emphasis on environmental management from the government and donors alike. Segmentation and isolation of responsibility for environmental education is a problem. At this stage, these institutions are not harmonised in the approach or delivery of Environmental Education.

The government delegates the responsibilities of environmental education to a range of its agencies. Most specifically, the MEEW has a unit directly responsible for awareness for topics such as: Waste Management, Environmental Impact Assessments, Environmental Regulations, Protected Areas, Biodiversity and the Maldives ‘Greening Program’. This will be done through school environment clubs and the production of environment awareness raising materials: leaflets, posters, banners, calendars and an environment day celebration. The Maldives have specialised centres for Environment Research, Marine Research, Education Development & Non-Formal Education and MEEW, all of which are linked to environmental education. The following highlights some of the relevant government mandates:

- The Environment Research Centre is mandated with the responsibility to “plan and implement environmental education and extension activities”
- The Marine Research Centre is mandated with the responsibility to “create awareness amongst people and the government on fisheries and the utilisation of other marine resources”. It also compiles books and other information for the public
- The Education Development Centre is mandated with the responsibility to “produce educational audio-visual programs”



- The Non-Formal Education Centre is mandated with the responsibility to “conduct courses to increase awareness and teach skills for youth and adults, and produce newspapers, magazines, posters and other such materials to increase awareness

In general, environmental awareness may be considered as being low, but increasing. During UNEP’s mission, they noted “a relatively low value of wetland areas among many of the local residents” and that the “conservation value of mangroves has only been recently recognised.” They further stated that “there is a real danger that a key habitat may be irretrievably (damaged by) poorly informed recovery actions in the coming months.” The **National Biodiversity Strategy & Action Plan (NBSAP)** states that:

A general lack of awareness and appreciation at all levels of society of the implications of biodiversity loss and the true value of biodiversity lead to conservation and sustainable use of biological resources being considered a minor issue in the national context. In addition, the limited knowledge and understanding of biodiversity and its status in the Maldives exacerbates the situation.

The most notable government expression of environmental education is through nationally & internationally recognised days such as World Environment Day, International Biodiversity Day, World Ozone Day etc. As an example, World Environment Day is conducted every year in the Maldives and in 2004 a special focus was placed on the theme, ‘Wanted! Seas & Oceans – Dead or Alive?’ This theme promotes awareness of the state of the oceans and places importance on people’s choices. Activities included: a special supplement in the newspaper, tree planting, clean-ups, quizzes, special assemblies and even a special environment song. There were also awareness programs on radio and shown on TV. The government also celebrates World Food Day annually. In 2003, the theme was ‘Biodiversity for Food Security’. In line with this, MOFMAR held activities on a well-known agricultural island (Sh. Feevah), displaying local produce and increasing awareness of biodiversity.

The government also holds a range of specialty workshops on varying themes. Aquarium fishery workshops have been held in 2002 & 2003 to increase awareness of the fishery and to provide information on strengthening data collection and monitoring. The President also has specific national environmental awards for schools and ‘green’ tourist resorts.

There has been very little evaluation of environmental education in the Maldives, however a report by Bhandari & Abe (2000), ‘Environmental Education in the Asia-Pacific Region: Some Problems and Prospects’, highlighted the following environmental education practices in the Maldives:

- The 2nd National Environment Action Plan emphasises environmental awareness
- A President’s Environmental Award Scheme has been established for schools
- Grades 1 to 5 have Environmental Studies courses with teacher’s guides and reference materials
- Grades 8 to 10 have a Fisheries Science course
- Environmental clubs are active in schools

The aforementioned report highlights the strong links between environmental education and formal education, but does not highlight many non-formal approaches. The Ministry of Health has conducted an ‘Evaluation on IEC materials Use & Impacts’ in 2002. This report is very relevant to environmental education and highlights that there are significant difficulties in distribution, both getting materials to the locations and then getting them into use. The report also shows that the major way respondents received information was directly from health workers and from radio and television, with only 25% saying that posters and leaflets were a major source of information. The most preferred source of information is person to person, in this case from Health Workers. When asked what information they needed, the respondents were unable to identify their needs.

The RAP was carried out in five Island communities with a total of 35 community focus group participant and 28 interviews with community leaders



RAPID ASSESSMENT OF PERCEPTIONS (RAP)

The RAP, is a social investigative research method developed by Live & Learn Environmental Education, and was undertaken as part of the ADB-assisted Tsunami Emergency Assistance Project (TEAP). It was designed to assess community perceptions on issues relating to sustainable development, recognise that social and human habits shape the way we manage natural resources, and then use the findings to shape effective tools to change knowledge, attitude and practices. Sustainable development and poverty reduction is often stimulated by changes in knowledge, attitude and practice within the community; hence the need for education approaches to be informed by social parameters. Therefore this research makes few comments on technical environmental factors.

It should also be noted that the findings in this report are not based on sustained research but on a rapid assessment and are tailored specifically to guide the development of high impact education tools to advance sound environmental management. This research also forms the basis for evaluation of project outcomes. This report provides the background and community consultation regarding Environmental Education and Community Mobilisation in the Maldives; a subsequent report will be developed, using these findings, specifically focusing on a long-term strategic approach to implementing Environmental Education and Community Mobilisation.

BACKGROUND

ADB appointed Live & Learn Environmental Education to provide Technical Assistance (TA) to the Government of the Maldives for

'Promoting Sound Environmental Management in the Aftermath of the Tsunami Disaster. This RAP was conducted during December 2005 and January 2006 in support of the TA and specifically developed in partnership with the Ministry of Environment, Energy & Water (MEEW).

The goal of the TA is to improve environmental sustainability in the Maldives. This will be completed in-line with moves to achieve the desired Millennium Development Goals (MDGs). The more immediate objective relates to the development and testing of an environmental management program for tsunami-affected islands that focuses predominantly, but not solely, on environmental health and awareness.

The TA is comprised of four closely interrelated outputs, namely: (i) supporting actions towards sustainable water management, (ii) building capacity for environmental assessment, (iii) testing and promoting innovative environmental education and public awareness, and (iv) organising for community-based environmental management.

The target audience of the TA is the general public, local decision-makers, teachers and government departments. National and local stakeholders will play a key role in promoting sound environmental management in the Maldives. From the onset of the TA partnerships have been developed with and sustained through meaningful dialogue,



respect for local culture and recognition of existing knowledge and practice. The TA collaborates with current initiatives and will make full use of existing capacity, networks, activities and resource materials.

THE NEED FOR A RAPID ASSESSMENT OF PERCEPTIONS.

For environmental management to be successful it needs to be informed by an assessment of stakeholder perceptions on related issues. The RAP employed a data collection methodology (Refer to Annex 3) that was highly participatory whilst remaining feasible within the scope of the TA. Through utilising a combination of participatory mapping and ranking cards in community focus groups, interviews for community leaders and questionnaires for teachers, data were collected about community members' perceptions of environmental issues, opportunities for action, comprehension of social/environmental linkages, ability for future thinking, and perceptions of who makes decisions about the environment, along with ideas of what tools the community would like to be part of an environmental education campaign.

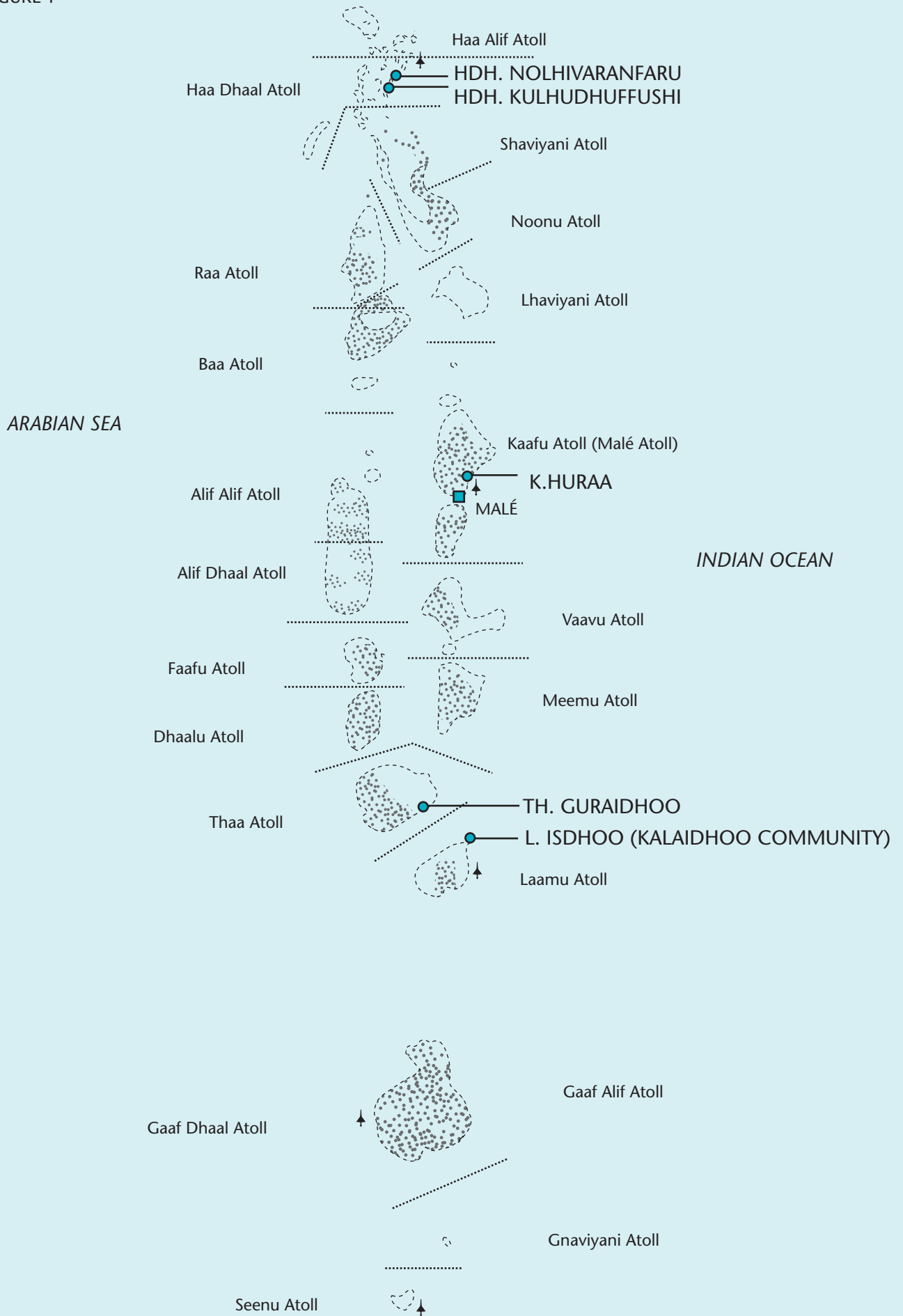
The objective of the RAP was to provide an analysis of the main factors and variables in people's perceptions that must be taken into consideration in the design and development of forthcoming environmental management tools and methodologies for viable and effective activities.

The RAP was carried out in five Island communities (*Figure 1*) with a total of 35 community focus group participants and 28 interviews with community leaders. These data were further supplemented by 81 questionnaires completed by primary school teachers and students studying at the teachers college in Male'. Equitable gender representation was sought throughout the study.

In addition to the assessment of perceptions of individuals and groups from these community sites, practitioners who are involved with environmental management and environmental education programs also took part in a brainstorming session and informal interviews.

Figure 1: Five Island communities representative of the different zones of the Maldives were selected to be research focal sites. An additional community acted as a pre-test community.

FIGURE 1



Water, toilets, waste, beach erosion and health were highlighted as the most significant environmental issues of concern



A. COMMUNITY

A focus group discussion was held in each of five communities; each group averaged seven participants with an average of four female and three male participants (*Figure 2*).

WATER USAGE AND SANITATION

Environmental resources are generally considered as communal: in particular water has historically been considered in a communal way, with communal wells available at the mosque, government offices and even at private houses. These communal wells were traditionally used for drinking water and cooking while water from household wells was used for other purposes.

Washing, drinking bathing and cooking were the reported uses for water. Communities identified three separate main water sources: well water,

rainwater and desalinated water. On one occasion bottled drinking water was also mentioned as the final back up when other drinking water was not available and communities undertaking agriculture also included the use of water for agriculture plots; this may infer a subtle perception difference in water use based on livelihoods.

Water is used in religious practices (ablution) however none of the communities highlighted this as a specific use of water. In a Muslim country like the Maldives this may be one of the most significant cultural uses of water, but it is most likely it was assumed we understood that washing can include ablution, or washing, for religious purposes.

Pollution of the island's ground water particularly around wells was the main concern reported, with the perception that such pollution diminishes the

quality of life by impacting on their general health. This is in line with the fact that, until recently, most families relied on well water for washing, cooking and drinking. For years, technical reports have established well water is unsuitable for drinking due to poor maintenance and contamination by sewage from septic tanks. Community reaction to this, apart from an attempt to source better well water, has been generally limited.

Rainwater has become an important source of drinking water and the collection of rainwater has seen limited use of well water. In the past some communities considered the well water from the mosques to be better; they collected water for drinking at the mosque and stored it in water jars at the house. Now people are more cautious and know that this water can also be fouled by salinity and septic waste.

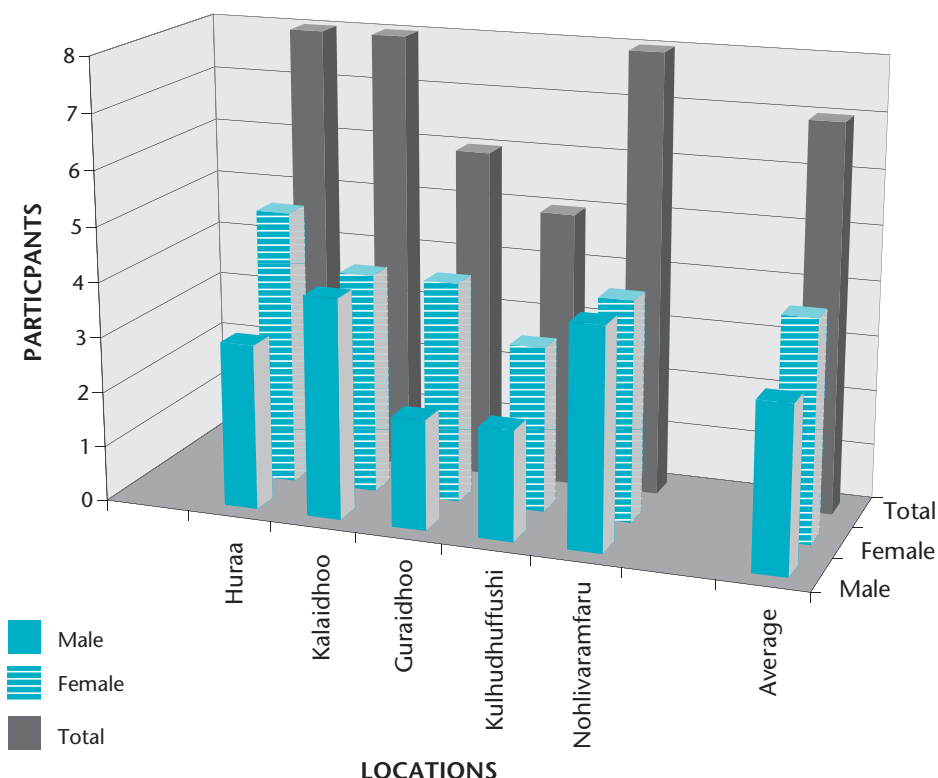
The change in the source of water for drinking is a very marked behaviour change. This has come about in some part through necessity, as salinity caused by the tsunami had made the water undrinkable. Since the tsunami, many households have received rainwater tanks from donors: over 15,000 rainwater tanks have been delivered.

Although water is an issue of significant concern, there is limited action taken to make its use more

economical by using water efficient appliances. When water is limited its use is restricted by necessity. People are more careful with water in the dry season, as they know they may run out of rainwater. But when it is readily available it is used excessively with little thought for the future. This is an important factor that needs to be further researched. In places such as Male', Villigili, and Hulhumale, dual reticulation systems are used with one pipe for drinking and cooking water, sourced from rainwater or desalinated water, and another piping system for well water for uses such as flushing toilets, washing etc.

A consultant report for ADB (GWP 2005) shows that although people's rainwater tanks are running dry, they are only using some of their roof area for rainwater collection. The consultant was mainly concerned about the tanks running out during the dry season leaving people with no alternative other than using groundwater for drinking. People could use more of the roof area for collecting rainwater and could increase the capacity of the tank to collect more rainwater to last the whole year. Discussion and observation during this research highlighted that increasing the roof area for rainwater collection may not be of additional benefit as overflowing tanks can cause localised flooding. This may be some of the reasoning for

FIGURE 2 – GENDER OF FOCUS GROUP PARTICIPANTS



only part of the roof area being guttered for use in water collection. If this is the case, it seems that families have greater water harvesting potential than is currently being utilised. However, the needs must be carefully calculated according to the number of people using the tank and the size of available tanks.

Most rainwater tanks that have been given to households have mostly been linked to guttering using a first flush system. This is very important as the first flush system assists in removing potentially harmful debris (salt, animal faeces, etc.) from entering the rainwater tank. Traditionally, people who have collected rainwater have educated others about the need to clean roofs. This traditional knowledge combined with the first flush system is a good way of keeping the tank water clean, however, contamination is still possible. There is limited perception of any potential problems with the rainwater tanks. The RAP found that people are not aware of the need for cleaning rainwater tanks and no one was identified as being responsible for this activity.

In the past, houses have had larger land areas and, as such, wells and toilet areas were not placed close together. Now that house plots are smaller, septic tanks and sites for open defecation are closer to the wells. In terms of sanitation, most of the houses have toilets but these toilets are typically connected to septic tanks and not sited with consideration of the wells and location of the freshwater lens. Local perceptions are that the septic tanks are fouling the well water and people would like an alternative, but at present people are simply waiting for an alternative to be offered.

Different methods of sanitation are used throughout the Maldives. Most common are on-site sanitation systems using locally constructed septic tanks with soak pits. Usually these septic tanks are constructed poorly and not maintained well, thus contributing to pollution of groundwater. Open defecation on the beach or in the bush also occurs. Some sites have a designated compound inside the house, with a well for washing, used for defecation; the hole covered with sand after use. These traditional practices of open defecation are not openly discussed, even in communities such as Kalaidhoo on Isdhoo Island, where 50% of people have no toilet. Further questioning of people highlighted that, in houses, the shallow pit used for defecation is often very close to well sites

for the convenience of access to water for washing. When there have been cholera outbreaks in the past the government has used radio to educate people not to go to the toilet near the well.

Another alternative for those without toilets is to dig small pits in the vegetation on the coast for open defecation (also affectionately known as 'landmines'). This is usually done in vegetation, for privacy, and near the water to allow for washing. The availability of washing facilities for these sanitation practices is very important and any alternative toilets that might be set up must, as a priority, have suitable washing facilities.

Small pit toilets are, in essence, the most basic form of compost toilet. However, typically, people go from having no toilet to having a septic system, as they seem to perceive that the flush toilet is the best option. It seems there is very limited knowledge of other alternatives that may better suit the local situation.

UNDERSTANDING OF WATER-RELATED ISSUES, ENVIRONMENTAL IMPACTS

Water pollution, toilets, waste disposal, beach erosion and health were highlighted as the most significant environmental concerns. The participatory mapping exercise demonstrated good spatial awareness of these impacts. The temporal nature of these environmental issues may also be useful to consider, but were not discussed in this instance.

Testing of water quality seemed to be quite uniform across the islands with people identifying smell, taste and sometimes colour as indicators of potential fouling. The Island Health Centres had some involvement in more formal water quality testing, however this seemed quite variable across the study sites. Some were very active and conducting weekly monitoring of water quality, others monitored communal sites and were responsive to household requests, and a few had no involvement.

Strong links were identified between septic tanks and fouling of groundwater or the proximity to the sea (or impact of tsunami) and salinity. Although there may be some awareness of the impacts from septic tanks on well water, the reality is that the majority of the islands groundwater is being contaminated due to poorly designed and/

or maintained septic systems. There was also a direct link between the tsunami and the increase in salinity in the groundwater. This was noticed by the community not only from the informal water observation but also from the death of many plants that were not salt tolerant and from the tops of trees dying back, likely due to salt stress. There seems to be some understanding, especially on more agricultural islands, of the salt sensitivity of different trees. This may be utilised as a tool for biological monitoring of water quality.

As mentioned previously, the **sanitation or toilet facilities** may not be suitable for the communities' needs. Although most of the communities have

toilets, four out of the five communities highlighted toilets as a major environmental concern. The communities have an understanding of the impact of the septic tanks on the groundwater through informal and sometimes formal assessment of the wells. They see this as a significant environmental concern, but have limited knowledge of any alternatives and are waiting for the government to deal with the problem.

Waste management sites have been allocated by the Island Committees but have varying success in the study sites, with some being used actively and others not being used and open dumping of waste occurring in various places on the island. In most places there was no disposal facility for hazardous wastes. Women's Development Committees appeared to be one of the groups most involved in waste management however, again this varied from one community to another. This is consistent with a report by the Japan International Cooperation Agency reporting an estimated 75% of the waste stream to be organic. Communities indicated interest in the use of organic waste through composting, particularly agriculturally based communities.

Beach erosion was also highlighted as an environmental concern. It is known to be part of the natural processes but there was also some awareness of the ability to slow this process through vegetating of the coastal area.

FIGURE 3 – RANKING ENVIRONMENTAL ISSUES SUMMARIZED

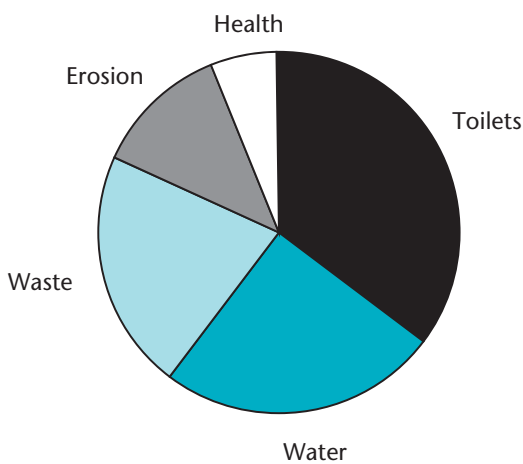
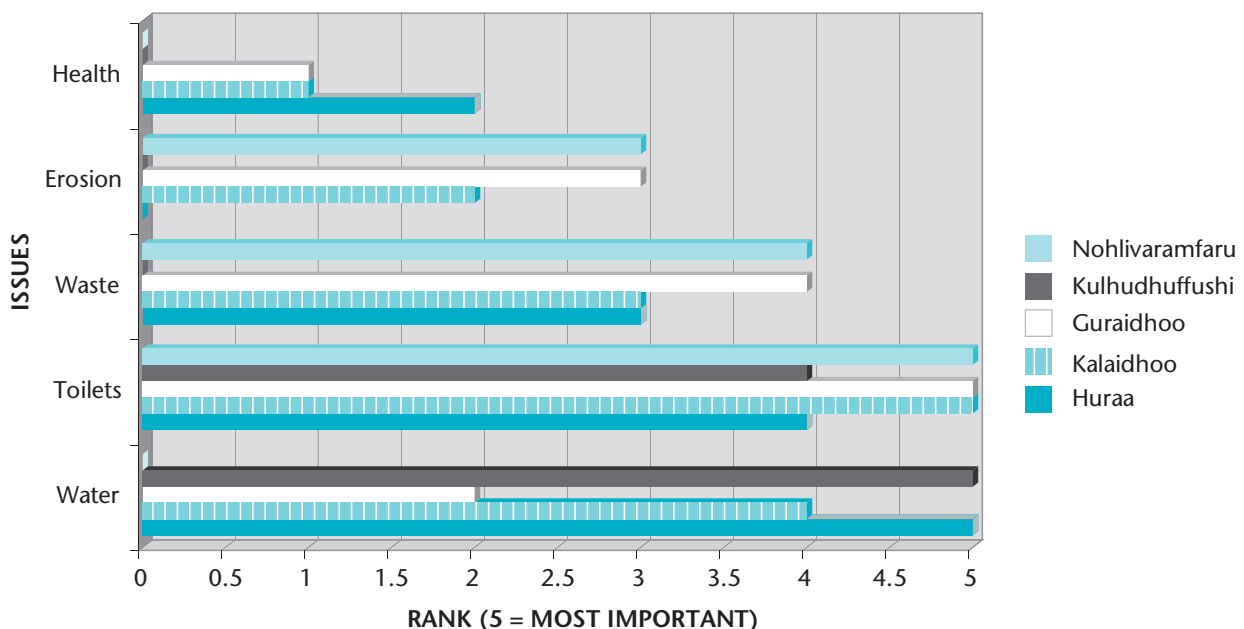


FIGURE 4 – RANKING ENVIRONMENTAL ISSUES BY COMMUNITY



Health was also mentioned as an environmental concern with an understanding of the link between pollutants or bacteria and health. In the past there have been health outbreaks such as cholera and diarrhoea where the Department of Public Health carried out awareness campaigns, especially regarding the need to boil water.

LINKS BETWEEN WATER ISSUES AND SUSTAINABILITY

The community perceives a link between water use sustainability and the availability of water for drinking and cooking. Water used for these purposes was deemed not sustainable based on water shortages and carrying capacity and there was a strong perception of the need for alternative sources.

Since the tsunami there have been significant **water shortages**, as well water could no longer be harnessed. In light of this situation it is understandable that the sense of water sustainability was directly linked to availability of water for drinking and cooking. The need to reduce septic tank pollution to the groundwater was highlighted, however, factors related to utilising existing resources more efficiently or harvesting more rainwater were not mentioned.

There was good understanding of **carrying capacity**, with participants relating the number and capacity of tanks to the population size and having knowledge of the number of months they could last on the existing water stores before the rainwater tanks ran out. Communities were very aware of the communal sites and emphasised that if rainwater runs out some people resort to drinking well water, while others may buy bottled water.

The **current drinking water supply is not sustainable** – it is based on rainfall and, as such, tenuously dependent on the weather. Sustainability was directly linked to weather, with discussions being in terms of how long people could last in the dry season before the rainwater tanks ran dry. There is a general perception that the weather is changing, but a sense that this is out of their hands.

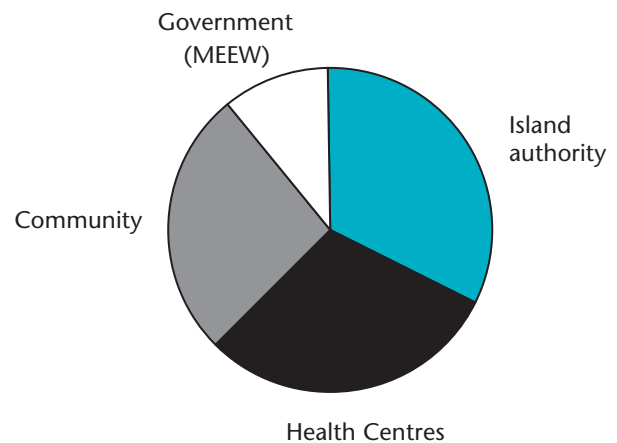
In line with the consideration that drinking water sources were not sustainable there is a strong perception of the need for **alternative** sources of water. Desalination was considered as one

alternative, but due to the expense people did not consider this sustainable and do not have the technical knowledge to maintain desalination plants. This would create dependency and remove communities' ability to manage their water supplies.

WHO MAKES DECISIONS ABOUT THE ENVIRONMENT

Island authorities, health centres and the community were perceived as the main decision makers on environmental issues (*Figure 5*), although this view varied by community (*Figure 6*).

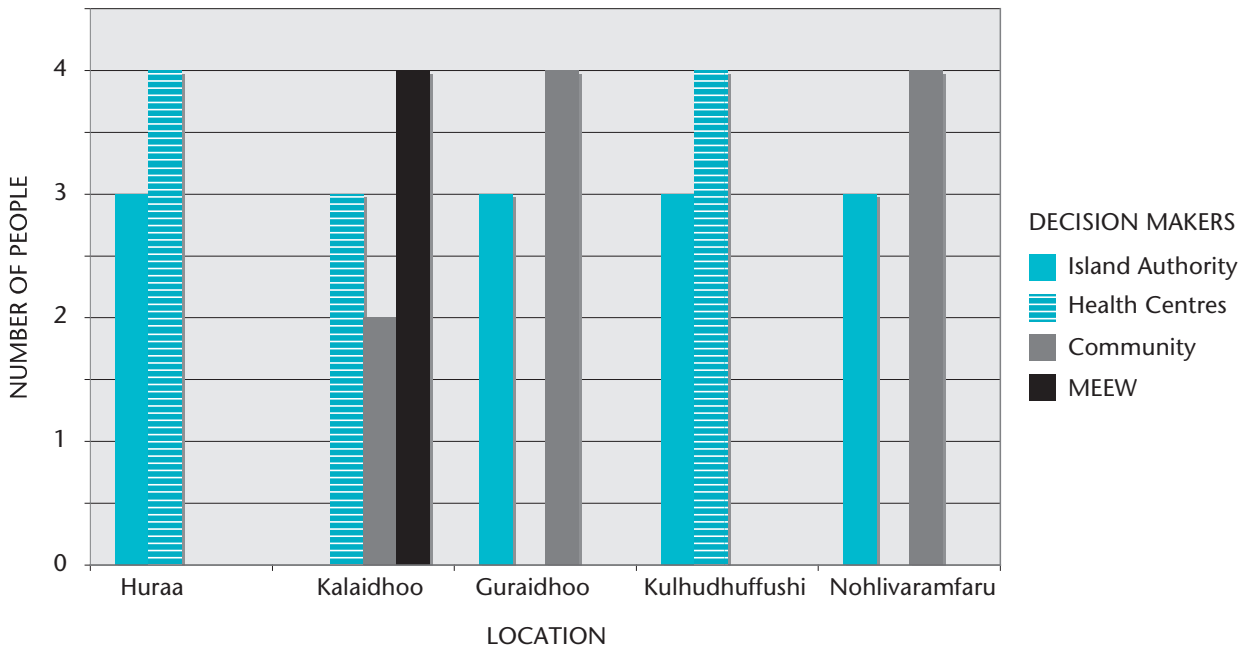
FIGURE 5
RANKING DECISION MAKERS, SUMMARIZED



The visibility, or lack thereof, of government offices such as the MEEW may have a significant impact on the degree to which the community sees their involvement in decision-making. Some communities, and even groups within the communities, felt that the community should be actively involved, while others sought external direction, especially from the government.

The government is moving to a more decentralised participative and consultative approach. In line with this, environmental management and education approaches should seek a more participatory community-based approach. Past systems have not involved the community in decision-making. Government staff and community members alike do not have much experience with the participatory approach. It will take some time to develop a more participatory relationship, where decision-making is shared between communities and the centralised government ministries. There will also need to be an active training program to instil participatory skills in government staff.

FIGURE 6 – RANKING DECISION MAKERS, BY COMMUNITY



Significant importance is placed on the community as decision-makers. The status of men in the community gives them the most opportunity to act on environmental issues, however the most active responses to environmental issues have come from women’s and youth groups. Women’s and youth groups should be seen as key stakeholders in any environmental management initiatives. This may suggest a gender imbalance, but in reality there are men involved in these groups and there does not seem to be a specific men’s group. On fishing islands there may be a gender imbalance in involvement in environmental issues due to men being absent while fishing and the women and youth remaining in the community.

Although religion plays a major part in day-to-day life and the culture of the Maldives, the mosques or religious leaders were not mentioned as being involved in making decisions about the environment.

The internal driving forces for decision-making are very variable based on individuals at the community level. In some cases, one person will hold many ‘decision-making’ roles through groups and government positions – for example, in Nohlivaramfaru a single person held five different roles of responsibility.

COMMUNITY BEHAVIOUR FOR ENVIRONMENTAL MANAGEMENT

Communities are participating in environmental management at different levels: from actively

solving environmental issues to passively asking for assistance. As highlighted previously, two focus groups felt that the people in the community were the most important decision-makers while another two focus groups did not even rank them.

Communities did not discuss in detail how they could change behaviour to promote environmental management. There was much greater emphasis on external inputs from the government (or donors) and the action they should take to make the situation better. There was a positive and strong willingness to trial alternatives. If these alternatives are not correctly or adequately explained to the community, or are misinterpreted, the community may act to stop the trial. This seems to have happened in Kulhudhuffushi, where a desalination plant initiative was unsuccessful due, apparently, to rejection by the community. People were reluctant to speak about this in detail.

Organisations engaged in environmental management initiatives have, in the post-tsunami period, been acting in an emergency response mode, primarily acting to fulfil urgent needs, with the longer-term sustainability of meeting these needs given lower priority. This approach has seen some communities waiting for ‘presents from the sky’; a sometimes disempowering activity that may make effective community mobilisation approaches more difficult to achieve.

Learning from past behaviour change initiatives such as the fuel-wood reduction will be critical to developing successful approaches for the future.



A restriction on cutting down trees made the price of wood higher and the use of alternative fuels such as kerosene more viable –therefore creating an economic incentive to change from wood to other fuel sources for cooking. This behaviour change has been highlighted in the Poverty Vulnerability Assessment and the Millennium Development Goals Report.

EDUCATION SOLUTIONS – COMMUNITY

Responses were very limited to questions about existing education and awareness activities and potential activities that could be of benefit. It seems this was not in participants frame of thought. Education is a key tool for environmental management, but to date it has not been used to affect the necessary changes required for environmental management in the Maldives.

In many cases, people relate education to schools only, and not to non-formal approaches. There are some posters on the environment but these were not mentioned. There may be a limited understanding of what constitutes awareness and education materials, for example, local television and radio have programs on environment and water awareness but these were not mentioned. This is an important consideration for future participatory approaches with the community.

It is very important to take full consideration of what people currently know and believe, in order to identify what might be the most effective tools. Much of this will obviously be based on people's current knowledge of existing activities that may be appropriate.

There is a lack of strategic environmental education being conducted throughout the Maldives with very few environmental and water awareness materials used on the islands, although there is a lot of opportunity. When asked about this, people said they have been given materials but they do not last. For example, some awareness sheets are pasted onto walls but soon fall off or are taken down.

Many communities have a basic understanding of the issues, but lack the power and technical knowledge to make changes happen. Environmental education activities should seek to empower the communities and promote localised technical knowledge to deal with environmental issues. The limited state of environmental education in the Maldives makes it necessary to reassess traditional approaches that seek a linear addition of awareness, knowledge, attitudes and skills in order to have sustainable actions. The rapid change in behaviour, as shown with fuel-wood use, emphasises that behaviour change is not necessarily reliant on linear additions in education but can be directly related to incentives.

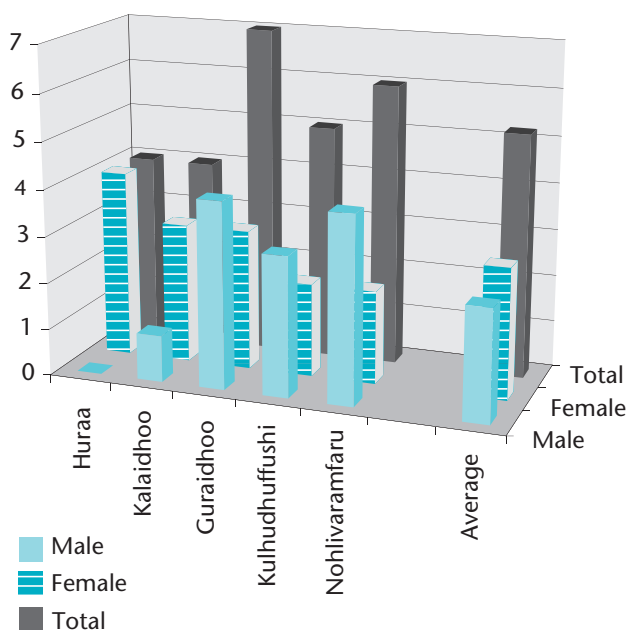
THE SOCIAL/ENVIRONMENTAL INTERFACE

An important part of the TA was to assess the existing environmental comprehension of community members. There are some specific environmental social issues that were highlighted that also show a variation in attitudes within communities.

An example from Huraa highlighted varying perceptions on the salt-water mangrove area, with younger people seeing a potential tourism opportunity whereas older people tended to see it as a potential breeding site for mosquitoes. Kulhudhuffushi specifically saw the salt-water mangroves as not having much value for other use, because -- if reclaimed -- the water would not be suitable for wells. However, when a road was built through the edge of the marsh area many people from the community took the opportunity to view the marsh.

Environmental education, as a tool for environmental management, needs to identify whether community members make connections between environmental and social issues. Simple connections, such as the link between septic seepage and fouled groundwater, show some understanding of this link. The underlying understanding of the carrying capacity of communities based on the availability of drinking water is also a strong social/environmental link that may facilitate an entry point for action.

FIGURE 7 – LEADER INTERVIEWS GENDER



B. COMMUNITY LEADERS

The study included 28 interviews with representative community leaders. We sought to gain equitable gender representation and, as shown in the table below (Figure 7), each group averaged 5.2 community leaders from each site with an average of 2.8 female and 2.4 male participants.

ENVIRONMENTAL INITIATIVES

The community leaders highlighted a range of positive environmental initiatives that are being conducted across the Maldives; waste disposal and tree planting being most commented upon.

Most of the islands have specific community involvement, often by the WDCs, in keeping the community clean. This entails a general clean-up of public areas. **Waste** sites were identified in all the communities but the success of these sites was variable with some not being utilised. The communities typically united to conduct waste clean-up activities around the community.

Tree planting – the government has initiated a ‘million trees program’ that many of the communities have been actively involved in. On some islands this has been directly linked to erosion control activities on the eastern beaches. To stop beach erosion, the Kalaidhoo Island Development Committee has attempted to stop community sand mining, but there has been resistance.

DIFFICULTIES IN GETTING THINGS DONE

Very few of the community leaders said they had no difficulties in getting things done. The major difficulties perceived included: a lack of community initiative and involvement, limited **awareness and interest** of situation and alternatives, not following regulations, relationship between leaders and community and the size of the community.

The reduction in the volunteering of community members for activities was specifically highlighted. A significant drop in the members of the Women’s Development Committee was noted on Kulhudhuffushi. There needs to be an incentive for people to be involved in community activities. There is a perception that committees such as the Island Development Committee, or WDC, should take the lead, but this is not happening, partly because of a lack of understanding of environmental issues and alternatives.

Regulations and systems for environmental management need to be strengthened. They are difficult to implement at community level, partly due to lack of community capacity and partly due to lack of community awareness of what they are aiming to do. Some examples of this are people not using waste sites, mining beach sand and drinking well water. In Kalaidhoo, this lack of **cooperation** was linked to the tsunami's impact on their livelihoods and the fact the community relationship with leaders was not good. Many are not happy with the government, as they are still living in temporary shelters and waiting for compensation.

Population size was perceived as a difficulty, with populations either too small or too large. Land area is a practical difficulty for larger populations with increased density making less room for waste management or sewage sites. The placement of wells and septic tanks in the house site is limited by the size of the house block and, with increasing population, the house blocks are getting smaller. Smaller communities noted that the lack of opportunities and infrastructure had seen a drop in population. A low population was considered to increase difficulty, as the communities would receive less support and have less people to do things. This was perceived as a downward spiral, as the less infrastructures and action the more people would move to other islands. This has led to a perception overall that a larger population is better.

RESOURCES NEEDED

Practical **infrastructure** for sewage and waste management was important, along with the community being a resource that needs to be better utilised. (Figure 8)

The focus of this infrastructure varied based on the community. Specific needs ranged from (i) access resources to develop a sewerage system, (ii) improve land use planning to reduce fouling of groundwater (iii) improve means of disposing water and (iv) assess to resources which will increase community awareness and cooperation.

ENVIRONMENTAL REPORTING AND COMMUNICATION

Most leaders commented on the importance of reporting to specific agencies for specific issues. The Island Office was reported to for most issues with health centres included for health issues. At household level it was perceived that people should deal with their own water and sanitation issues. Some leaders emphasised that the individual would first see if they could solve the issue themselves and, if not, they would then approach the Island Office. Only the leaders in Huraa mentioned that they would discuss issues with the youth. The graph below shows who the leaders would discuss environment issues with. (Figures 9 and 10)

FIGURE 8 – RESOURCES NEEDED

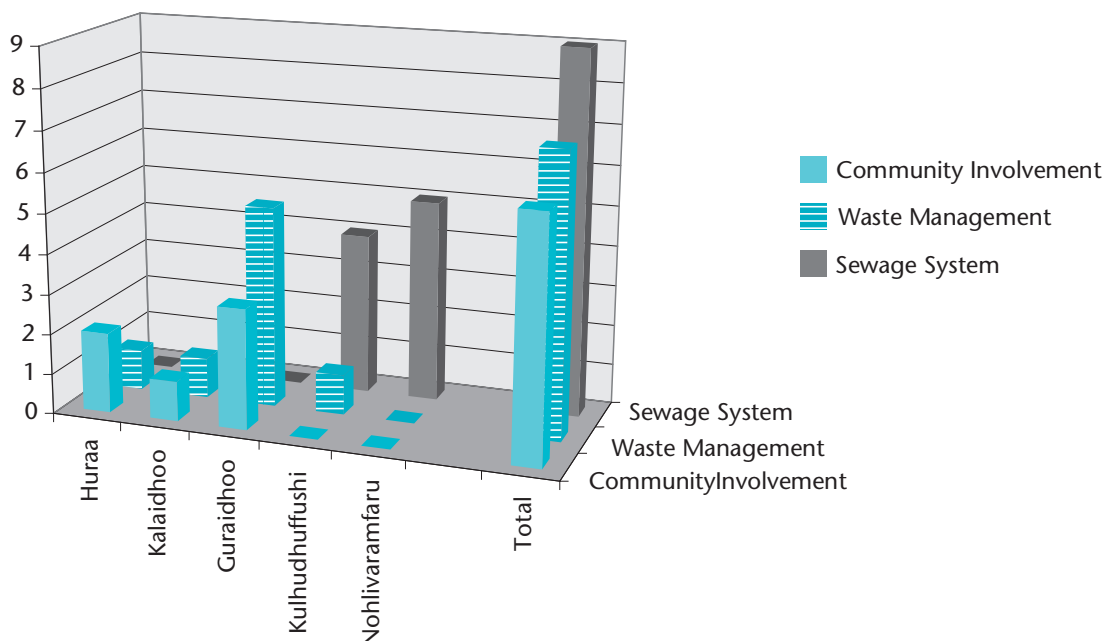


FIGURE 9 – DECISION-MAKING, BY COMMUNITY

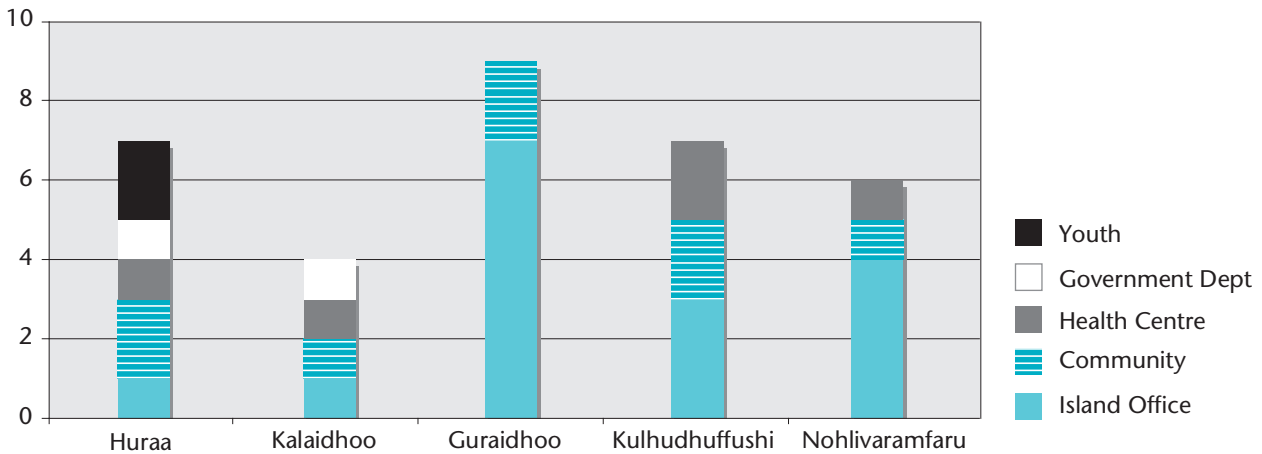
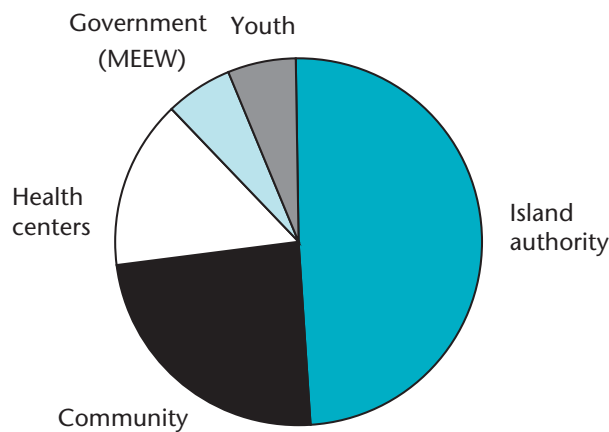


FIGURE 10 – DECISION-MAKING, SUMMARIZED



Lack of funds was seen as limiting any action on issues and reinforced the importance of dealing with issues internally rather than reporting on them.

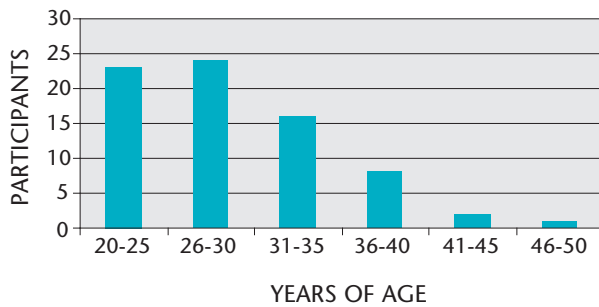
C. FORMAL EDUCATION

Formal education, and especially the schools system, is very strong in the Maldives. This has helped to develop well-educated youth with high literacy. Schooling is free and the costs involved in sending children to school are relatively low, but there is a significant regional disparity in the quality of education. The curriculum includes some focus on environment through subjects

such as Science, Social Studies, Environmental Studies and Fisheries Science. Unfortunately, these subjects often highlight issues but not alternatives and solutions. The Ministry of Education may be open to further environmental education but the curriculum is quite intensive, with little room to integrate anything else.

A questionnaire was distributed to 81 teachers from the communities and training colleges, including student teachers and those with years of experience (*Figure 11*), in an effort to gain the teachers' perceptions of what educational approaches they perceived as being most effective.

FIGURE 11: TEACHER QUESTIONNAIRE RESPONSES – AGE DISTRIBUTION



EDUCATIONAL RESOURCES

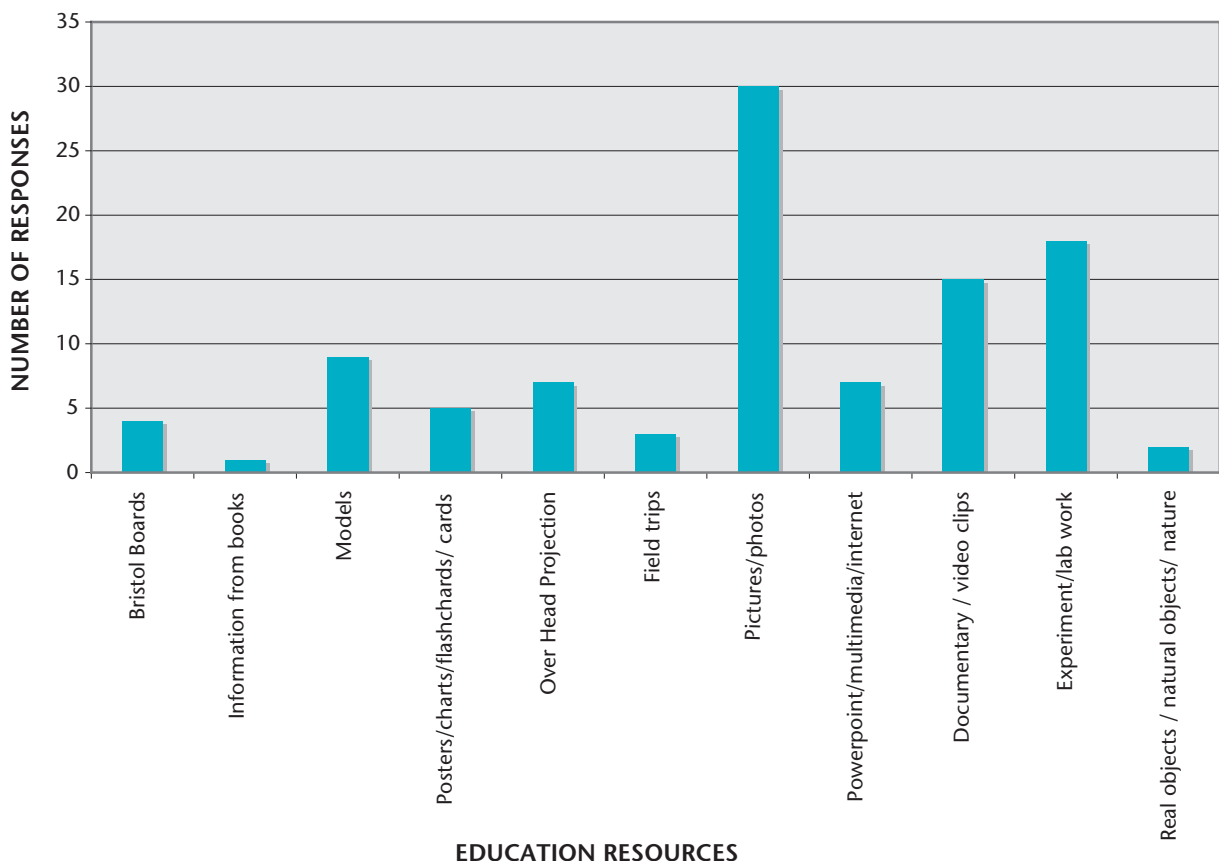
The formal education questionnaire specifically sought to determine types of existing written, visual and audio resources, which resources were considered most effective and what resources are most needed. Teachers desired more resources in order to promote environmental management. Only one teacher stated that they have most of the resources they need and that it is a matter of using the resources more effectively. Nine teachers (11%) stated that there are no, or limited, opportunities in the city to promote environmental management and very few areas like the local market and museum available for students to learn practically.

EDUCATIONAL OPPORTUNITIES AND CONSTRAINTS FOR THE ENVIRONMENT

Limited access to information has been highlighted in previous teacher surveys (Teacher Effectiveness Study, 2005), which specifically noted that reference materials for teaching were often scarce. Resources in libraries were noted to be “very few, so to seek information on any topic or issue is very difficult.” Reasonably functional internet facilities are not available in most schools. Some teachers reported that even the syllabi are not available in their schools. In implementing the curriculum (Environment and Social Studies), teachers rely mainly on the teacher’s guides and textbooks. “Teachers prefer to use more innovative methods in class, however due to the limited facilities available in the schools, teachers rely on the text books and are not able to use a variety of strategies in the class” (Teacher Effectiveness Study, unpublished).

Greater than 90% of teachers surveyed stated that there were many opportunities to promote environmental management in the schools. Ways teachers perceived that environmental management could be promoted were:

TABLE 2: MOST EFFECTIVE RESOURCES TO TEACH ABOUT THE LOCAL ENVIRONMENT



- Through field trips, using natural resources and the beaches
- Visual aids, video clips, pictures, multimedia and the chalkboard
- Library and tools used in the work environment
- Television, internet, computers, power point and the school science labs
- Study of local trees, birds, land and the atmosphere
- The environment of the island/school and local places like the fish market

Constraints in promoting environmental management were identified as:

- Limited access to teaching and learning resources
- Difficulty organising field trips as a major hurdle or drawback
- Organising transport as very difficult
- Lack of new information or teachers lacking information as a barrier
- While there are many areas to visit in order to promote environmental management, there is no means to get the respective information needed from the site
- New and recent material not available
- Limited time
- School management not wanting to adopt any new methods
- Not enough time allocated in the curriculum
- Textbooks are not localised
- Limitations on city students in undertaking field trips to make observations of living things and the environment
- Children, teachers and school management are too busy to focus on other activities

Primary teachers found using English as the **language of instruction** an issue as “most primary students cannot understand English sufficiently for academic work.” There is a preference to teach bilingually as when instructions and explanations in a lesson are conducted in English “students often answer back in Dhivehi” and “when the lessons are taught in both languages, understanding is better”.

Instructional bilingualism may seem the obvious solution to this puzzle, but teachers’ own limited English skills may not allow them to switch comfortably back and forth between English and Dhivehi. One teacher bemoaned, “there is no possibility to work on their own to improve their language skills, due to limited resources.” Others felt that most of the Dhivehi medium trained teachers are not skilled enough in English to teach in that medium. (Teacher effectiveness study, Unpublished). Table 3 summarises mean scores of teacher perceptions of the importance and efficacy of teaching environment studies through curricula. The table shows that, although the teachers highlight the importance of these fields of study, they are not satisfied with the know how to teach them effectively.

TABLE 3. MEAN SCORES FOR IMPORTANCE AND EFFICACY ON ENVIRONMENT CONCEPTS

(1-6 scale with 6 being highest)

CATEGORY	IMPORTANCE	EFFICACY
Environmental Studies / Science – Content knowledge	4.4	3.56
Environmental Studies / Science – Knowledge of teaching methods	4.44	3.5
Environmental Studies / Social Studies – Content knowledge	4.36	3.59
Environmental Studies / Social Studies – Knowledge of teaching methods	4.39	3.55

Source: Teacher Effectiveness Study (Unpublished)

KEY FINDINGS

➤ KEY FINDING 1:

Communities are most concerned about:

- Water (quality & quantity)
- Waste (solid & sewage, collection, treatment & disposal)
- Beach erosion (minimisation)
- Health (links to water)

➤ KEY FINDING 2:

Variation in community willingness to participate:

- Some communities were not active in environmental management and were waiting for government to act
- Other communities were active, indicating strong community willingness to participate in environmental management

➤ KEY FINDING 3:

The community perceives that water pollution poses public health and environmental hazards, leading to a deterioration of quality of life

- Attitudes toward having a clean environment differ among individuals and groups within the community, such as between youth, women's and men's groups

➤ KEY FINDING 4:

Interest in alternatives for water supply & waste management:

- Community interest in acquiring the skills and knowledge needed to make compost
- Some communities were enthusiastic about experimenting with alternative water supplies

➤ KEY FINDING 5:

Youth groups and WDCs appear most active on environmental issues

- Possibly linked to occupation, as fishermen, for example, leave the island for work more often than women
- There is also no specific men's organisation and men can play a significant role in the youth clubs and WDCs

➤ KEY FINDING 6:

Some knowledge about the environment but different values (positive & negative) within the community regarding the natural environment:

- Communities lack the power and technical knowledge of alternatives to deal with environmental issues
- The mangrove forest on Huraa is a good example, with elders concerned about the mosquitoes and considering filling it in, while the youth see the mangrove forests have potential benefits from tourism

➤ KEY FINDING 7:

Community leaders considered it important to try to deal with environmental issues themselves, but government agencies were ranked highly as decision-makers about the environment.

- The Island Committees were mentioned as the most general point of contact and Health Centres were particularly emphasised regarding water management and sanitation
- Specific ministries such as Environment, Energy & Water or Public Health were also mentioned regarding specific issues

➤ KEY FINDING 8:

Communities have communal use of environmental resources.

- Water has historically been considered in a communal way, with communal wells available at mosques, government offices and even private houses

➤ KEY FINDING 9:

Common to all five communities is the belief that increased awareness can play a role in better local environmental management; however, they also demonstrated a reluctance to discuss behaviours that impact the environment.

- There seems to be a dichotomy with people seeing awareness as important but being reluctant to consider individual behaviours
- There is a lack of understanding of what types of tools they would like and the information they need

➤ KEY FINDING 10:

Teachers perceive that there are opportunities for teaching about environmental management.

- Most teachers don't feel there are enough resources to do this effectively

LESSONS LEARNT

Existing Environmental Management and Environmental Education activities in the Maldives have been historically limited, but are gaining increasing profile, especially in light of the external inputs from donors in response to the tsunami. Learning from past behaviour change initiatives, such as the previously mentioned fuel-wood reduction, will be important in developing successful approaches for the future.

The delivery of environmental education needs to be more action oriented. The existing focus on awareness has been shown to limit impact on behaviour. There is little evaluation of environmental education success in the Maldives. Evaluations that have been conducted have measured outputs such as the number of materials developed or trainings conducted, rather than indicators of true impact on knowledge, skills and action competencies. A more qualitative evaluation of environmental education in the Maldives is an important first step prior to the development of more strategic approaches to environmental education in the country.

Although education is a major part of addressing key environmental concerns, environmental education is rarely seen as a viable priority or major strategy option. Mechanisms for sharing good practice in environmental management and education tools and methodologies adapted for local needs are currently underdeveloped in the

Maldives. There is, however, an understanding that this is an area that needs development.

The government is moving towards a more decentralised, participatory and consultative approach. In line with this, environmental management and education approaches should seek a more participatory community-based approach. Past systems have not involved the community in decision-making. Government staff and community members alike do not have much experience with the participatory approach. It will take some time to develop more participatory relationships between communities and government ministries, and government staffs need participatory skills to facilitate this.

Expectations for technical reporting can make it difficult to conduct and report on qualitative research. Indeed, limited understanding and acceptance of qualitative research can make it difficult for it to be accepted outside of academic fields. The focus of this research is to provide a base for environmental education and community mobilisation. These fields are not easily researched because testing people's knowledge does not necessarily provide any insight into their actions. Alternative approaches to measure people's perceptions should be assessed for their usefulness in future studies. Efforts should also be made to increase understanding of qualitative research and its role in the development of educational resources.



Women have a primary role of environmental management in their household and were found to be more aware of environmental health links



CONSIDERATIONS, RECOMMENDATIONS AND CONCLUSIONS

CONTEXTUAL FINDINGS

The Maldives has a history of challenging environmental management issues and many of these have gained increased attention in the aftermath of the tsunami. Major environmental management issues identified by the government include: climate change, scarcity and pollution of freshwater resources, waste management, air pollution, and biodiversity conservation.

Organisations engaged in environmental management initiatives in the post-tsunami period have been acting in emergency response mode. Priority has been afforded to fulfilling

urgent needs, while the longer-term sustainability of meeting these needs was given lower priority. Education is a key tool in sustainability, however to date it has not been developed to its potential in effecting the necessary changes required for environmental management in the Maldives.

Nearly 90% of the water demand is still fulfilled using ground water. Hence, it remains the main source of water in the islands. Most people rely on well water for washing, bathing, toilet flushing etc. while rainwater is mainly used for drinking and cooking purposes. However, people tend to use well water for drinking and cooking when rainwater is scarce during the dry season. These wells are mainly inside mosques or fresh water areas. After the tsunami, some islands have been provided with desalination plants to meet the potable water requirements of the communities.

Even before the tsunami most people had been using rainwater for drinking only and most of the domestic needs are met by ground water. In some islands, the salination of groundwater was made worse after the tsunami. People using well water for potable purposes were not able to use it anymore. There has also been significant increase in rainwater harvesting due to advocacy from the government.

The communities researched were most concerned about the pollution of the island's ground water, particularly around their wells. The RAP highlights a perception that this pollution diminishes their quality of life by impacting on their general health. This is in line with the fact that, until recently, most families relied on well water for washing, cooking and drinking.

There is a lack of strategic environmental education being conducted in the communities participating in the RAP and throughout the Maldives. Reviewed documents highlight a lack of awareness of environmental issues. Education activities should seek to empower the communities and promote localised technical knowledge to deal with environmental issues. Women and youth should be seen as key stakeholders in any environmental management initiatives.

The Poverty & Vulnerability study highlighted a rapid change in behaviour in regard to fuel-wood use, in that restrictions on cutting down trees made the price of wood higher and alternative fuels such as kerosene more viable, thus providing an economic incentive to change from wood to other fuel sources for cooking. The report emphasises that behaviour change is not necessarily reliant on linear additions in education. As such, environmental education in the Maldives should reassess traditional approaches that seek a linear addition of awareness, knowledge, attitudes and skills to bring about sustainable behaviours. Education linked to incentives is more likely to effect positive behaviour change; education without action is not likely to be effective.

From the information recovered and lessons learnt, the progression should be viewed as cyclical. It seems community environmental education tools need to be action-oriented, while the other usually linear progressive elements (knowledge, attitudes, & values) need to be built in so they occur simultaneously to the action. In this way, benefits

will be seen directly; thereby providing direct incentive for further actions to be conducted.

CONSIDERATIONS FOR INNOVATIVE ENVIRONMENTAL EDUCATION TOOLS

1. Encourage community participation.
2. Encourage people to think about the future and encourage the development of solutions to problems.
3. Link knowledge to action and change.
4. Address environmental needs and concerns identified by schools and/or communities.
5. Culturally appropriate.
6. Can be developed and implemented within budget in a short period (3-4 months).
7. Link with existing (Government & Non-government) programs & initiatives.
8. Do not replicate projects that already exist.
9. Can be implemented through schools or other existing community organisations.
10. Are sustainable – there are pathways for a community to feasibly implement the projects in the future.
11. Are potential models to adapt and replicate across other Island communities.

There should be consideration of using individual champions and change agents on each island. Such individuals and organisations were identified in the RAP. These individuals and organisations are locally respected and already active in environmental management and may have a key role in building the capacity of others.

Individual change agents may be drawn from schools, health centres and village elders. There are also a range of semi-government community based organisations such as the WDCs and Youth Clubs. Most communities also have environment clubs, but these are currently inactive.

Women have a primary role of environmental management in their household and were found to be more aware of environmental health links. The WDCs in some sites are actively engaged in waste management activities and play a supporting role in other community initiatives.

Religion also plays a significant role in the formation of individual attitudes towards key issues such as

education, health and the environment. Islam can point to an appreciation of the world's resources as a fundamental tenet of its faith. Religion plays a major part in daily life with prayer times breaking the day into specific components. The Friday prayer is very important, with a standardised prayer given throughout the country. The opportunity to link environmental management with mosques in the Maldives could be further utilised. For example, communal wells and communal water tanks are based in the mosques for members of the community to use as back-up sources of water.

The government of the Maldives is in the process of moving toward a more decentralised system of government. The changing political and local administrative situations are having a disruptive effect on the communities. This highlights a general resistance to change in many of the communities. At the same time, it demonstrates a willingness from the government to allow for greater participation and involvement of communities in managing their own affairs.

There are significant areas of environmental management on which non government organisations and donors are working with the government. Waste management is one such area, with significant external resources being made available to assist the government. There are many opportunities within waste management for innovative environmental education to be explored. The separation of organic waste for composting is one area that would link well with education. Current practices of burning



waste at household, community and commercial levels could also be assessed, in order to develop supportive educational approaches.

There are currently few opportunities for communities to make themselves heard in civil society on environmental management issues. There may be an opportunity for tools to link the means of participation in civil society (eg literacy) to increased involvement in environmental management. However, there is danger of increasing community feelings of responsibility for the environment and not matching this with increased empowerment from those currently holding the power.

UNDERLYING PRINCIPLES FOR INNOVATIVE TOOLS AND METHODOLOGIES

In line with the government's moves toward decentralisation, one of the most innovative approaches to environmental management in the Maldives will be through community participation.

A strong formal education system has seen literacy rates grow significantly in the past decade. This formal education system now needs to integrate environmental education into curricula in order to increase understanding of, and action for, environmental management in the Maldives.

The focus of past environmental education approaches in the Maldives has been awareness and knowledge based. Placing greater emphasis on action oriented environmental education is critical to success. Awareness alone does not change behaviours. The promotion of best practices and learning by doing will provide innovative tools for behaviour change, which is the ultimate goal. There needs to be a process orientation to environmental management rather than an output orientation.

The 'building back better' approach that has been promoted by the United Nations for the Maldives and other tsunami-affected countries is a significant and innovative approach that should be further developed. The psychology of taking a negative situation and looking at the positive potential is very encouraging. The Maldives seems to be taking this on board as they are actively increasing environmental management initiatives such as waste management across the country.



The general focus of EE in the past has been within the biophysical paradigm, exploring environmental linkages and some 'cause and effect' theories. While this paradigm is important and relevant, more attention needs to be paid to the social and economic processes that mediate environmental sustainability. EE carries the greatest impact when delivered through a socio-economic paradigm, which links to policy, sustainable livelihood and community development in a broader sense.

The research shows that many community members are aware of the degradation of surrounding environment by water, however many appear to have less understanding of alternatives or the social/economic skills needed to act on this awareness. In part, this may link to an optimism that was highlighted in relation to sea-level change with people preferring not to consider the negative and instead responding with a laugh and comment that 'perhaps tomorrow the land will rise'.

A common misconception about environmental behaviour is that it is directly linked to knowledge and awareness. People may behave in a certain way because they do not know enough about environmental issues. Therefore, a common strategy is to spread information to raise awareness. The basic assumption of this approach is that if people are informed that their actions

are destructive to the environment then they will adopt more environmentally friendly behaviour. Unfortunately, behaviours and behaviour change are much more complex.

In the case of the communities involved in the RAP, their knowledge is generally high however, they do not have the equipment, power or time to put their knowledge into action. Providing information can be a very useful tool, but it is not enough to change environmental behaviours in the Maldives. The TA needs to focus not so much on communities acquiring information about the environment, but applying deliberated solutions into action.

In Maldivian culture, a younger person does not question an older person's knowledge and, certainly, an older person is not told or influenced to change their behaviour by a younger person. In this sense, it is important to realise the limited impact that educating the younger generation can have for engendering catalytic change in the older population. A more sustainable form of development must seek to raise the knowledge and environmentally responsible actions of adults. The non-viable alternative is to wait a generation until the youth of today are elderly themselves. Currently the trends are changing and more elders respect the knowledge and information the younger generation has acquired.

Ultimately, people learn more from the actions of other people around them than they do from formal education. We must seek to use modes of non-formal education that are linked to positive behaviours. Environmental education must do more than inform communities about the long-term benefits of environmental preservation. It must show the environmental assets can provide a stream of income both in the immediate and long term future.

The purpose of this TA is to strengthen the capacity of communities, organisations and the government to catalyse action and change. TA target groups should be made aware that the ultimate focus is environmental management and that environmental education is broadly concerned with the following:

- Enhancement of economic opportunities and sustainable use of natural resources
- Improvement of practice in curriculum development and educational participation rates
- development of opportunities for, and skills of, participation in civil society
- provision of basic services to local communities
- facilitating the recognition and utilisation of traditional skills and practices



THE WAY FORWARD

Critical thinking needs to become a key ingredient in all EE ventures because it questions knowledge and values. When EE is combined with action-based learning, it requires investigation of local issues and relies on local participants' willingness and skills to enable environmental, social and structural change.

Active participation of communities in the development process of solving community-based problems is a prerequisite for durable EE. These kinds of skills are paramount to interpreting root causes of environmental issues and in examining teachers' and students' perceptions of, and contributions to, environmental and social change.

Starting with the learner, we must ensure that there are always one or two clear 'do-able' messages in community EE activities. If efforts are spread too thinly or vaguely over a range of issues, these efforts may fail to induce meaningful action or change. This is especially of concern for short term initiatives

Having fresh and innovative tools is not enough to ensure that communities will participate in activities. It is necessary to identify the drivers behind the success so that people engage in activities that target prime community concerns in a meaningful way. Prime concerns are clearly such things as income generation and improved health. Increased knowledge is only actively sought if it can be combined with primary concerns. Realistically, in the community context, members can only have meaningful and lasting redirection toward more sustainable practices if those practices can be directly linked to income generation.

To fully maximise the impact of EE in the TA, the tools and methodologies chosen will need to recognise that more attention needs to be given to the link between family level micro-economics and environmental conditions. Attention must be paid to the complexity of human interactions with the environment, including the economic, political, cultural and social systems in which people operate, as well as the natural systems. As a consequence the tools chosen will need to tap into the local economy to make the environmental concerns a priority.

Catalytic environmental behaviour change will only happen if EE tools and activities connect to everyday activities that are primarily focused on income generation from fishing, agriculture and tourism.

Communities have many other focuses and post-tsunami pilot programs in operation. The TA's 'litmus test' will be its ability to be valued by recipient communities. At present, it is like 'gifts are falling from the sky'. Community engagement requires involvement however, the incentive to be involved is reduced when people are receiving something for nothing.

There is a need for emphasis on visual tools as, even though the literacy rate is high, there is not a strong culture of reading with most people preferring to watch television. Although posters and billboards are common in the Maldives, few promote the environment. Whilst these media may initially seem readily acceptable through their commonality, people were not enthusiastic about getting more posters and therefore alternative visual modes need to be investigated.

Opportunities exist for television and radio documentaries. One option for already overworked teachers may include television or radio broadcasts as part of their teaching. To relieve the pressure on teachers and streamline the time it would take to train more teachers it is suggested that mass media broadcasts would be advantageous. Such broadcasts should cover the importance of the environment and the actions needed to maintain it. Most importantly, tasks and activities need to be action-orientated. Opportunities exist for utilising traditional dance and theatre. It is important that such approaches be seen in addition to effective face-to-face education approaches.

Culturally accepted activities and information delivery channels are an important link. Religion plays a major part in daily life and in the formation of individual attitudes towards key issues such as education, health and the environment. Innovative approaches that respect traditional, cultural and religious knowledge make it easier for participants to cope with perceived risks related to behaviour change. The role of mosques as communal water sites increases their potential to support environmental education by linking it to people's spiritual learning and their relationship with the environment. To date, utilisation of the

mosques for environmental education has not been developed.

Waste Management: The principles of waste management are based around the tenets of reduce, reuse, recycle. The JICA 1999 study on solid waste management for Male' in the Republic of the Maldives projects that household wastes in the Maldives will be comprised of 75% Organic waste, 24.8% Inorganic waste and 0.2% Hazardous waste. With this in mind, composting is one of the most significantly innovative approaches that can be made toward waste management. Composting will significantly reduce the quantity of waste by removing organics from the waste stream and promoting the reuse of organic matter in the form of natural fertiliser and mulch for creation of nutrient rich soil for home gardens and agricultural plots. Furthermore, this will reduce the use of chemical fertilisers that can impact the groundwater.

CONCLUDING REMARKS

This RAP is designed to provide a basis for the development of EE tools and methodologies for environmental management. It is expected that the results will be translated into a design that is both effective and appropriate to the expectations and context of the beneficiaries.

This is not an exhaustive survey; it is designed to give a useful overview that may be used in the development of pilot tools and activities. The focus of these pilot tools and activities is environmental education and community mobilisation. These tools and activities will be evaluated and this evaluation will give us a greater understanding of the communities of the Maldives and appropriate tools and approaches for them.

This TA seems very timely, as the government is encouraging more community participation through decentralisation and there is an abundance of work on environmental management approaches around the country. We trust this RAP, and the development of tools and approaches in the pilot sites, will assist in promoting sound environmental management in the Maldives.

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Ideally, an assessment of perceptions should entail a thorough and comprehensive exploration and analysis of all stakeholder perceptions, issues and options. Practically, due largely to time constraints, this was not feasible. Consequently this the research approach was designed to consider both financial and time constraints within the scope of the proposed TA. The objective of the RAP was to provide an analysis of the main factors and variables in people's perceptions that must be taken into consideration in the design and development of forthcoming environmental management tools and methodologies for viable and effective activities.

The RAP allows for the collection of social data that will be used to shape training material and learning resources. This is a qualitative report on community perceptions and as such does not rely heavily on technical information and is not intended to serve as a technical report. The purpose of the report is primarily as background for the development of appropriate education tools for environmental management. Although technical knowledge may be strong, actions and behaviour are often more directly linked to perceptions. This social data collection is qualitative in nature. The focus of the research is on perceptions, as it is believed that people's perceptions are more closely linked with their behaviours than specific technical knowledge they may have. This is an innovative field of inquiry that has developed as environmental education and has moved more toward behaviour change than to awareness raising.

Key questions clarified during the RAP: (i) How do communities perceive water problems and their solutions? (ii) How do communities perceive constraints and solutions in accessing safe sanitation and hygiene? (iii) How do communities perceive the role of environmental education in changing knowledge, attitudes and practices at a community level? (iv) How do communities perceive self-management of water and the role of education to achieve self-management? (v) How are communities organised and how can community organisation and mobilisation be improved? The challenge with all research is to ensure objectivity. With qualitative data on people's perceptions, one of the best ways of ensuring objectivity is by documenting the data. The RAP serves to document the collected data to allow other practitioners the opportunity to

assist in seeing how and why our educational choices have been made. The RAP will therefore also serve as a tool for monitoring and evaluation as it also provides a documented overview of the researchers' view prior to conducting activities, thus promoting critical reflection of the actions.

In order to obtain high quality data, four qualitative research tools were utilised: (i) Participatory Mapping/Ranking, (ii) Qualitative Interviewing, (iii) Focus Group Discussions, and (iv) Questionnaire Surveys. The RAP targeted local leaders, teachers and representative community members. The RAP process was staged over four weeks and included: (i) development of research material, (ii) data collection, (iii) analysis of data, (iv) identification of findings in RAP report, and (v) recommendations on learning and training material content. To maximise the impact and sustainability of environmental education, the formal education system will be seen as a major change agent.

During the second week of December local staffs with education qualifications and experience in social research were recruited. Informal training and discussion were conducted in community research facilitation techniques, and methods for having a successful and consistent RAP methodology. This was supported by active engagement in the pre-test of the RAP focus group questions, conducted on Himmafushi Island on 17 December 2005. This pre-test highlighted community gender dynamics that needed to be incorporated into the research methodology.

RESEARCH SCOPE AND DESIGN

Audience

The research target groups were:

Target Group 1: General Public (on five islands)

Tools: (i) resource mapping and ranking
(ii) focus group discussion

Target Group 2: Community Leaders (on five islands)

Tools: (i) qualitative semi-structured interviews

Target Group 3: Teachers (including but not limited to five islands)

Tools: (i) Structured surveys

METHODOLOGY

The underpinning methodology of the RAP is that it is participatory. Participation is highlighted as integral to the success of development. The many definitions and levels of participation can make the concept confusing. Ultimately, the definitions can broadly be summarised to highlight involvement and power as the basic principles of participation. The type or level of participation used may vary during the course of an activity or project; some parts may be decision-making or citizen control whereas others may be manipulation or simply informing. Participation is also seen as a key to empowerment. Empowerment is specifically oriented around power and participation has the potential to enhance power. Unfortunately, the theory of handing over power is proving elusive, as those with the power do not necessarily believe in equity. Further, there is a danger that seeking empowerment as an objective has the potential to create other problems.

The theories of participation, such as its importance in development and empowerment, have been utilised in practical applications of participation. These applications have continued to evolve thereby creating new participatory approaches.

DATA COLLECTION AND ANALYSIS TECHNIQUES

The specifics of the participation method are the tools, often referred to as participatory tools. These are very dynamic and constantly changing with use of different facilitators in different areas and for different focuses. Participatory methods and tools are well documented in standard manuals. This research will not replicate these, but rather emphasise the key participatory methods that have been used in this process, summarising the general concepts and stating how they were used for this project.

The tools chosen for this study were those that the facilitators were most comfortable with and believed would help collect data in a participatory manner. The following descriptions of these tools will not be definitive as, in reality, the specifics of the participatory tools change with each facilitator and in each situation.

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 to help gain several layers of information in a very useable format.

Where the situation allows, it can be useful to start with a walkthrough 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. The concept aims to have participants consciously look at their physical environment with a key focus on such things as water, resources, problems, solutions etc.

RANKING

Ranking allows the participants to work through the issues and, as a group, prioritise them. This leads to group discussion about perceptions of importance. More issues may also arise as participants 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 note what they see as the key issues. This tool can be linked to other tools and used to summarise issues for further discussion and/or ranking. It can be important in-group verification of the data collected before it is documented.

COMMUNITY FOCUS GROUPS

Focus groups bring together selected representatives of the community to discuss the topic of interest. The aim of the facilitators is to stimulate discussion and discourse amongst the participants using a list of questions as a guide (see below). The group responses may be documented in writing or recorded onto a tape, later transcribed, by research assistants. The size and make-up of each focus group should ensure that all participants can feel free to speak out and can be clearly heard.



For this study six to eight representatives were chosen for each focus group. The focus groups included women, men and youths (both sexes). It was important that these groups be separated to encourage active participation from those involved.

The community make-up is very important – the participants need to represent all the key groups in the community. Gatekeepers of the community are effective representatives. Include focus areas for the island such as agriculture, fishing, business, boat-owners & elders.

Consider the population size of external groups in the community – if large, more representative groups, such as teachers, may be formed.

COMMUNITY – FOCUS QUESTIONS

1. What are the uses of water in the community?
Participatory mapping exercise highlighting the use of water.
2. What sanitation is used in the community?
Sanitation uses & locations shown on the participatory resource map.
3. What issues/problems are linked to water usage?
Using this map what issues/problems/conflicts can you see occurring and how do these things impact/affect water?
4. How do you know if there are any impacts to the environment/water?

Is there any formal or informal monitoring of the environment or water quality?

5. What environmental/water awareness materials & actions are used in the community?
List, and where possible give examples of, the awareness materials & activities.
6. Is community water use sustainable?
What do you think might be the situation for community water in five years time if things continue as they are?
7. Who makes decisions about the environment/water in the community?
Group ranking to show who makes the most decisions about the environment to the people who get the least say about environmental decisions.
8. How can community behaviour become more sustainable for water management?
Highlight a selection of the water issues/problems and link these to community actions. What community behaviour causes the issues/problems and how can this be altered/adapted/reduced.
9. What education materials/actions would you like to see come out of a campaign to assist your community to make a difference?
Are there any direct links between the issues/problems and proposed materials/actions?

COMMUNITY LEADERS – INTERVIEWS

Semi-structured interviews were used with community leaders from the five islands. The interviews were conducted on an individual basis and targeted the following: Village Chief, Magistrate, Health Post Manager, WDCs, Youth Clubs (sports etc), and School Headmaster. It was also important to be flexible to allow for interviewing leaders of specific groups such as agriculture or fishing if available. It was envisaged that there would be more than seven interviews of community leaders in each village.

The focus of the interview was based on the participatory map. Each community leader was asked to look at the map and comment on the information presented. The following questions were used to stimulate the discussion.

- What positive environmental/water initiatives has the community been involved with?
- What are some of the difficulties getting things done in the community?
- What resources do you need to become more effective?
- Is the community participating in any development activities on the island? (Focus on the last year) What, where & when? Were people from the broader community involved?
- Which groups are most active in gaining community participation?
- How can we mobilise the community to do environmental management?
- Who do you communicate with about environmental/water issues?
- What communication channels could better facilitate this?
- What level of dialogue do you have with the authorities?
- What are the constraints to open dialogue with the authorities?
- How can we make links to authorities more effective?

TEACHERS – SURVEYS

Teachers were surveyed using a self-administered written questionnaire. Participation was not exhaustive but tailored to gain a range of teachers from communities and educational establishments and with a range of experience.

Eighty-one teachers completed the surveys from the following locations: two schools in Male' (Ghiyaasudheen School and Iskandar School) and from the 3rd and 4th year students from Maldives College of Higher Education, Bachelor of Education-Primary course. In Iskandar School, the questionnaires were given to teachers who attended the first session of the school (morning session). These teachers teach Environmental Studies and Social Studies in Grades 1–7. In Ghiyaasudheen School, the questionnaires were given to the teachers who work in afternoon session. The teachers teach Environmental Studies in Grades 1-5. The students in Bachelor of Education-Primary course have taught Environmental Studies, Social Studies and Science in the primary schools across the Maldives. Experience among the students ranges from 3 – 20 years.

We were most interested in environmental education and the teachers' feedback on some specific areas. During analysis the results were viewed alongside the 'Teacher Effectiveness Survey'.

- Which environmental studies resources are most effective? Why?
- What environmental studies resources are there now? Are any of these conducted outside the school grounds or outside the curriculum?
- Are any of these resources supplemented with locally available information and/or case studies? Which & where? Have mapping exercises been included?
- Is there any culturally or environmentally important information on your island? Is it incorporated into the environmental studies curriculum? If yes, what & how? If no, why not?
- Are there major environmental issues for the island on which you are teaching? Are they covered in the curriculum?
- Which resources would be most effective to teach about the local environment and environmental management? (describe environmental management)(Please rank the responses – 1 being most effective)
- What opportunities exist for environmental management to be promoted in the schools? What constraints are there to doing this?

LIMITATIONS & CONSTRAINTS

Bias is one of the most significant limitations and constraints on any qualitative research. An important component of the research aimed at reducing bias was the use of feedback loops. The first feedback loop was between the local and international staff that conducted the research. The second feedback loop sought consideration from other key stakeholders, with a specific focus on government departments (MEEW, MWSA & MA). Such approaches cannot entirely remove bias, but they can serve to highlight potential bias and in doing so reduce it.

The research utilised **participatory approaches**, which acknowledges that the local people have a better understanding of their situation than outsiders do. Participatory approaches can help to reduce bias from external researchers, but the use of these approaches is a specific skill and, in

the Maldives, government staff has only recently started to move toward decentralisation and participation. There is limited understanding and experience with participatory tools, as such the research pre-tested the participatory approach and adapted to make the research more effective.

Focus groups and interviews are most often criticised for their lack of control over the environment being studied. However, it is often found that society cannot be fully understood until those experiencing the situation study it. The specific context and un-reproducible nature of the research may lead to difficulties in validating the findings. Personal over-involvement in focus group discussions may also bias or influence the conclusions of the bigger group. It is important to be aware of these issues and undertake measures such as research note taking, triangulation and constant comparison to decrease their prevalence.

Gender & involvement varied greatly depending on the community. In some communities, the focus group discussions were difficult to conduct, especially the mapping exercise, because there was hesitancy on the part of the elderly in the group, who have not attended formal schooling, to draw on the maps. However, once drawn they were very much involved in pointing out the locations of their water tanks and septic tanks. In other groups, the men were more dominant and tended to point out the landmarks and the important areas on the map. In another community the women were more dominant than the men because they represented the institutions in the community, such as the health centers and the schools, while the men represented the minority groups such as the fishing community.

Questionnaires enable researchers to gain simplified information across a wider audience in a reasonable timeframe. Unfortunately, return rates for questionnaires are notoriously low. When the return rates are very weak it can bring into question the validity of the data. There may also be significant bias introduced when the research facilitator is in closer contact with certain groups leading to a greater response rate. The teacher questionnaire was given out to teachers when

the researchers were in the field. They were given to responsible teachers, preferably a supervisor in the school. A request was made to return the questionnaires when completed. However, some of the questionnaires were handed out when schools were not in session or during school holidays. It is worth considering whether questionnaires should have been handed over with a formal letter from the Ministry of Environment Energy and Water so that they were followed up based on the formal letter. One practical constraint is the transportation difficulties from the communities where the schools are located. The questionnaires returned were all from schools in Male' and from 4th year and 3rd year Bachelor of Education students from the Faculty of Education. This may show a distinct bias of respondents as the researchers are also working with the Faculty of Education in Male'.

Field visits have proved to be one of the more challenging activities during the course of the RAP. One major hindrance is finding transport to the designated communities where the RAP is being conducted. The RAP was conducted during the school holidays and EID holidays and thus coincided with the peak of local travel, so organising transportation was difficult. There is no established mechanism of inter island or intra island transport and thus it is one of the biggest logistical challenges. The weather also plays a crucial part in the logistics, with the onset of monsoons and the timing of wet weather.

On a technical level, there may be **linguistic limitations** as some of the responses and data collection was in Dhivehi and then translated into English. Although English literacy is high, it is still a second or third language, so when trying to explain personal perceptions the first language may be more effective. This was specifically highlighted in the Teacher Effectiveness Study, (unpublished), which highlighted teacher difficulties in using English for teaching. Whenever information and/or data cross language barriers there is the chance it will be misinterpreted and the quality of the data reduced. The use of the feedback loops were also sought to highlight potential misinterpretation of the research.

SELECTION CRITERIA

The following were used as a guide to selecting the participating communities:

- Five islands are to be chosen
- Tsunami affected islands
- Rehabilitating water & sanitation
- Link & proximity to ADB sites (Th. Guraidhoo or H. Dh. Kulhudhuffushi)
- Link to other organisations and initiatives for environmental management - Red Cross 75 Islands – water & sanitation facilities.
- Seek to link with alternate approaches
- Seek combination of larger and smaller communities
- Seek alternative dominant livelihoods – industry, agriculture & fishing
- Try to work with a relocated community
- Two North, two South & one middle
- Travel cost must be a consideration

SUMMARY OF SPECIFIC RAP FINDINGS FOR EACH ISLAND COMMUNITY

1. In Kaafu Atoll, **Huraa**, the younger generation of the island community would like the swamp to be developed as a tourist site, so that the island community could generate an income from the swamp and also preserve the swamp area. The above suggestion has been floating around for a while with the island development plan submitted to the Ministry of Atolls and Development from the community in K. Huraa. The teachers on the island would like to document the vegetation and the living things that exist in the swamp.
2. In Thaa Atoll, **Guraidhoo**, the community, especially the women’s development community, would like to acquire the skills and information needed to make compost from kitchen waste and also to experiment with small-scale solar desalination.
3. In Laamu Atoll, **Kalaidhoo**, the community is waiting for the JICA project to electrify and lay the sewerage system and the attitude of the community is that they have not had time bounce back from the impact of the tsunami as yet.
4. In Haa Dhaalu Atoll, **Kulhudhuffushi**, the community is enthusiastic about small-scale solar desalination, which would provide an alternate source for safe water. However, the community has recently had a bad experience with a solar power (photovoltaic) desalination unit, which pumps out brackish groundwater.
5. In Haa Dhaalu Atoll, **Nolhivaranfaru**, the community is very small with a total of 267 people living on the island. The island is an agricultural island and the community members expressed their interest in acquiring information on waste disposal and making compost for agricultural purposes.



COMMUNITY	HDh. KULHUDHUFFUSHI	HDh. NOLHIVARANFARU	K. HURAA	Th. GURAIIDHOO	L. ISDHOO (ISDHOO AND KALAIIDHOO)
POPULATION	Total: 7479 Female (3826) Male (3922) Youth (3723)	Total: 638 Female (337) Male (301) Youth (325)	Total: 725 Female (353) Male (372) Youth (263)	Total: 1816 Female (896) Male (920) Youth (658)	Total: 2042 Female (989) Male (1053) Youth (941) Population of Kalaidhoo community (1103)
GEOGRAPHICAL INFORMATION	Area of island 172.20 hectares Distance from capital 274.15 km	Area of island 150.16 hectares Distance from capital 281.59 km	Area of island 18.80 hectares Distance from capital 21.20 km	Area of island 16.90 hectares Distance from capital 206.74 km	Area of island 293.67 hectares Distance from capital 224.87 km
PRIMARY OCCUPATION(S)	Shipping, Engine repairing, fishing, rope making, tourism related work, black smith	Agricultural farming, masonry, business (retail)	Fishing, tourism related work	Fishing, business, shipping	Masonry, shipping, fishing, agricultural farming, business
EDUCATIONAL STATUS	Total no of schools: 3 Atoll education centre, offers education up to grade 7 Regional secondary school: offers schooling up to grade 12 Nearly all children attend schools up to grade 10.	Total no of schools: 1 Primary School 1-7 Nearly all children attend schools up to grade 7.	Total no of schools: 1 Pre-school (1) Primary and Secondary (1) Nearly all children attend schools up to grade 10	Total no of schools: 1 Pre-school (1) School grades 1-10 (1) Nearly all children attend schools up to grade 10.	Total no of schools: 1 School grades 1-7 (1) Nearly all children attend schools up to grade 7. Kalaidhoo school population 400
HEALTH STATUS	Regional hospital Doctors (8) Community health workers (3) Family health workers (5) Nurses (39) Community water tanks 4 Private rainwater tanks 1256 No. of houses with toilets 1010 No. of houses with water pumps 610 Sewerage system is not connected to the sea.	Health Centre Doctor (1) Nurse (1) Family health workers (2) Community water tanks 12 Private rainwater tanks 44 No. of houses with toilets 65 No. of houses with water pumps 6 Sewerage system is not connected to the sea.	Health Centre Doctor (1) Nurse (1) Family health workers (1) Community health worker (1) Community water tanks 7 Private rainwater tanks 49 No. of houses with toilets 152 No. of houses with water pumps 124 Sewerage system is not connected to the sea.	Health Centre Doctor (1) Nurse (1) Family health workers (2) Community health worker (2) Community water tanks (not available) Private rainwater tanks (not available) No. of houses with toilets (not available) No. of houses with water pumps (not available) Sewerage system is not connected to the sea.	Health Centre Doctor (2) Nurse (0) Family health workers (3) Community health worker (2) Community water tanks 12 Private rainwater tanks 30 No. of houses with toilets 87 No. of houses with water pumps 3 Sewerage system is not connected to the sea.

*The fisherman
needs to know the sea
to catch the fish*



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