



**REPORT ON EDUCATIONAL NEEDS
ASSESSMENT FOR THE WESTERN
INDIAN OCEAN REGION**

JACQUELINE N. UKU and JULIUS FRANCIS

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Disclaimer: The findings, interpretations, and conclusions expressed herein do not necessarily reflect the views of the UNEP or WIOMSA. The opinions and conclusions in this report are those of the authors.

Educational Needs Assessment for the Western Indian Ocean Region

An assessment study undertaken by WIOMSA on behalf of the UNEP-GEF WIO-LaB Project entitled 'Addressing land-based activities in the Western Indian Ocean Region'

Report prepared

by

**J. N. UKU and J. FRANCIS
WESTERN INDIAN OCEAN MARINE SCIENCE ASSOCIATION
P. O. Box 3298, Zanzibar,
TANZANIA**

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LIST OF ABBREVIATIONS AND ACRONYMS

APERGE	Appui Regional a la Promotion d'une Education pour la Gestion de l'environnement (Regional Environmental Education Project)
CDA-ICM	Coast Development Authority Integrated Coastal Area Management
CEAS	Coastal Environment Award Scheme
CORDIO-EA	Coral Reef Degradation in the Indian Ocean-East Africa
CUEA	Catholic University of Eastern Africa
DINALEDI	Department of Science and Technologies and the Department of Education in South Africa
EAWLS	East African Wildlife Society
ECOFRESS	Ecological Friendly School Strategy
EE	Environmental Education
EECC	Environmental Education Coordinating Committee
FAO	Food and Agricultural Organization
FEE	Foundation for Environmental Education
FET	Further Education and Training
GEF	Global Environment Facility
GET	General Education and Training
ICM	Integrated Coastal Management
IFERE	Institute of Education in Comoros
IOI-EA	International Ocean Institute-East Africa
IUCN	International Union for the Conservation of Nature
IYFW	International Year of Freshwater
KESCOM	Kenya Sea Turtle Conservation Committee
KMFRI	Kenya Marine and Fisheries Research Institute
KWS	Kenya Wildlife Service
LBA	Land-Based Activities
MACEMP	Marine and Coastal Environment Management Project
MICOA	Ministry for Coordination of Environmental Affairs
MPA	Marine Protected Area
MWW	Municipal Waste Water
NEMC	National Environment Management Council
NGO	Non Governmental Organization
NIE	National Institute for Education
NRF	National Research Foundation
PADH	Physical Alteration and Destruction of Habitats
PMU	Project Management Unit of the UNEP-GEF WIO-LaB Project
PNUD	Programmes des Nations Unies pour le developement (United Nations Development Programme)

PRE COI/UE	Programme Regional Environment de la Commission de l'Océan Indien (Regional Environmental Programme of the Indian Ocean Commission)
REEF	Roving Environmental Education Facility
SAASTA	South African Agency for the Advancement of Science and Technology
SCMRT-MPA	Seychelles Center for Marine Research and Technology Marine Parks Authority
SMB-Retailers	Small and Medium Sized Retailers
SPLASH	Special Program for Learning and Awareness on Species and Habitats
SWAC	Solid Waste and Cleaning Agency
TCMP	Tanzania Coastal Management Partnership
TIE	Tanzania Institute of Education
UN	United Nations
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNDP	United Nations Development Programme
USAID	United States Agency for International Development
WED	World Environmental Day
WCK	Wildlife Clubs of Kenya
WCS	Wildlife Conservation Society
WCS	Wildlife Clubs of Seychelles
WIOMSA	Western Indian Ocean Marine Science Association
WIO	Western Indian Ocean
WWF	World Wide Fund for Nature
WWF-EAME	World Wide Fund for Nature East African Marine EcoRegion

EXECUTIVE SUMMARY

The impacts of land-based activities on the marine environment have been recognised widely in the Western Indian Ocean (WIO) region and this is the focus of the UNEP-GEF WIO-LaB Project entitled 'Addressing land-based activities in the Western Indian Ocean region'. The project is executed within the framework of the work programme of the Nairobi Convention, and is furthermore meant to serve as a demonstration project for the UNEP Global Programme of Action (GPA) for the Protection of the Marine Environment from Land-Based Activities (LBA).

The WIO-LaB Project sub-contracted the Western Indian Ocean Marine Science Association (WIOMSA) to undertake an assessment of educational needs in the WIO Region in relation to the impacts and management of land-based activities on the marine and coastal environment. The overall aim of the Educational Needs Assessment was to establish the specific educational needs in the WIO Region in order to enable UNEP-GEF WIO-LaB Project develop a specific educational programme geared at increasing awareness of the general public on the importance and means of addressing the impacts of land-based activities to the coastal and marine environment, through the development and implementation of, and support to existing educational programmes. The assessment targeted stakeholders involved in educational activities in the different WIO countries.

The consultants used National Experts and Focal Points of the WIO-LaB project to conduct the educational needs assessment either by the use of questionnaire or by discussions with people involved in different educational programmes. Input was received from experts and resource persons in Kenya, Tanzania, Comoros, Seychelles and South Africa on aspects ranging from completed and ongoing education initiatives, support to curriculum development by national and international organizations, development of awareness materials, the presence of training programmes for teachers and professional guides in Marine Protected Areas (MPAs).

Respondents were also requested to select priority areas for educational awareness based on the sectors targeted by WIO-LaB. The major shortcoming with this survey was the low number of responses in view of the fact that there are numerous education initiatives being in different WIO countries. To overcome this limitation, reports and documentation on different educational initiatives were also studied used to input into the report.

The findings of the educational survey indicate that educational programmes in most countries cover only limited aspects of marine and coastal environmental management, whereas some countries in the WIO region have in place more advanced education programmes in this regard which may prove to be useful in sharing of experiences between countries. From this survey, countries with advanced and coordinated educational and outreach programmes included Seychelles and South Africa.

The use of beach clean up campaigns to raise awareness in schools is one area in which the WIO-LaB project can contribute. This activity is one that the WIO-LaB project can fund in Zanzibar and Comoros and modelled it along the International Coastal Cleanup campaigns that held in Kenya annually.

The Coastal Environment Award Scheme (CEAS) conducted in Tanzania was successful in raising awareness on environmental issues as well as securing the support of communities during the development of the National Integrated Coastal Management Strategy. This programme promotes public participation in management of natural resources in the coastal region of Tanzania and encourages the use of environment friendly technologies and practices and demonstrates government commitment to integrated coastal management (ICM). Kenya has recently legalised the establishment of the Beach Management Units in coastal areas. CEAS could be used to motivate the communities to establish BMUs and make them operational.

South Africa is the only country in the region that has been participating in the the Blue Flag programme and the other countries in the region could benefit from its experience. Other countries such as Kenya, the Seychelles and Mauritius with substantial tourists visiting its coastal areas every year could be assisted to initiate the Blue Flag Programme in their beaches so that it gives them an added value over upcoming markets.

The revision of the book *A School Teacher's Guide to Marine Environmental Education in the Western Indian Ocean Region* along the lines of the text book produced by Nature Seychelles and the Seychelles Ministry of Education called *Learning for Sustainable Living in Seychelles* would be a notable contribution to the production of awareness material by the WIO-LaB project. This book could be translated into Kiswahili, French and Portuguese in order to make it more accessible to a wider audience in the WIO region. The revision of the book would provide the authors with an opportunity of inputting more updated information that could be of relevance to areas of concern within PADH, MWW and legal aspects of the WIO-LaB project. Such as book would also be instrumental in raising awareness in WIO-LaB Project priority areas and it could also serve as a teaching guidebook (resource book) for MPA managers, guides and mainland populations that are not based at the coast but whose activities are felt by impacts in the coastal zone.

It is also recommended that awareness materials should be produced collaboratively with organizations involved in educational activities so as not to duplicate efforts made by each of these organizations in producing similar packages for dissemination.

While not all countries provided inputs into this educational survey, the findings of this assessment may be applicable to all countries in the WIO Region as other sources of information such as earlier needs assessment and project reports were consulted in order to have a good regional perspective and the recommendations made in this education survey will be instrumental in raising awareness on the impacts of land-based activities on the marine ecosystem in the school systems and public domain of the WIO region.

1.0 INTRODUCTION

1.1 BACKGROUND INFORMATION AND SCOPE OF THE STUDY

The project “Addressing Land-based Activities in the Western Indian Ocean”, also referred to as “WIO-LaB Project”, is implemented by the United Nations Environment Programme (UNEP), and is financed by the Global Environment Facility (GEF) and the Norwegian Government. The WIO-LaB Project focuses on addressing major land-based activities (LBA) in the Western Indian Ocean (WIO) Region and represents a strong partnership between the WIO Countries (Kenya, Tanzania, Mozambique, South Africa, Madagascar, Seychelles, Comoros and Mauritius). The project basically aims to achieve three major objectives:

- 1) Reduce stress to the ecosystem by improving water and sediment quality
- 2) Strengthen regional legal basis for preventing land-based sources of pollution
- 3) Develop regional capacity and strengthen institutions for sustainable, less polluting development.

The project has a four-year implementation plan (2005-2008), addressing priority issues on Land Based Activities in the Western Indian Ocean Region. The project is executed within the framework of the work programme of the UNEP/Nairobi Convention for the protection, management and development of the coastal and marine environment in the Eastern Africa region, and is furthermore meant to serve as a demonstration project for the UNEP Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities (GPA).

Within the context of its third objective, the WIO-LaB Project sub-contracted the Western Indian Ocean Marine Science Association (WIOMSA) based in Zanzibar in the United Republic of Tanzania, to undertake an assessment of training and educational needs in relation to its activities and objectives in the WIO Region (Refer to Terms of Reference in Annex 1).

The overall aim of this Needs Assessment was to lead to the development of an Educational programme which will form the basis for (i) the development of the capacity required in order to effectively implement the various WIO-LaB Project activities and (ii) increase the capacity of stakeholders in the region to effectively manage and control the impacts of land-based activities on the coastal and marine environment.

The assessment targeted stakeholders including legislators, decision makers, the private sector and community groups with the aim of assessing the existing education awareness activities focused on the impact of land based activities on the marine ecosystem in key sectors that include tourism, aquaculture, ports and harbors, coastal mining, municipal waste water management, solid waste management and agriculture. These sectors have

been identified by the WIO-LaB project as areas that have direct environmental and management impacts on the marine ecosystem within broad thematic areas such as Physical Alteration and Destruction of Habitats (PADH), Municipal Waste Water Management (MWW) and related policy, legal and institutional aspects.

This report documents information from countries which provided comprehensive input concerning educational programmes. These countries include Kenya, Tanzania, Comoros, Seychelles and South Africa. The report consists of information on past educational initiatives and those currently being conducted by different organizations in countries that participate in the implementation of the WIO-LaB Project. The information provided included support to curriculum development in each country, development of awareness materials by different organizations, the existence of training programmes for teachers on WIO-LaB Project focus areas, as well as priority areas for public awareness in the different countries. The input provided from the different countries has been synthesized to provide recommendations on how WIO-LaB Project may support environmental programmes in the WIO Region.

While not all countries provided inputs into this educational survey, the findings of this assessment may be applicable to all countries in the WIO Region as other sources of information such as earlier needs assessment and project reports were consulted in order to have a good regional perspective

1.2 METHODOLOGY

National Experts and Focal Points of the WIO-LaB project conducted the education needs assessment either by the use of questionnaires (Annex II & III) or by discussions with people involved in different education programmes. This was a qualitative survey that captured different views and opinions of the different respondents in the different countries. In some countries questionnaires were administered to individuals while in others information of existing activities was collected and synthesized by the national expert contracted to undertake the survey. Where questionnaires were administered in Kenya and South Africa the total number of respondents was 23 while in the other countries national experts provided a comprehensive overview of activities in their countries.

Enquires covered support to awareness building activities such as awareness seminars, environmental clubs, visits to marine protected areas, open days and school competitions. Enquires were made on activities that support curriculum development as well as the development of awareness building materials. Involvement in teacher training programmes (Environmental Education, EE) was also determined. Respondents were also requested to select priority areas for education awareness based on the sectors targeted by WIO-LaB. Provision of training and educational support to professional guides within Marine Protected Areas (MPA's) was also evaluated. The survey conducted in South Africa also targeted specific input concerning school levels for

appropriate impact and learning areas that would benefit from information pertaining to land based activities.

Many education initiatives have been conducted by a multitude of organizations in different WIO countries. Information from these initiatives is summarized in both this national and regional overview report. Not all WIO-LaB partnering countries provided inputs into this educational survey and to overcome this limitation reports on earlier needs assessment and information on various education initiatives were consulted to provide a greater representation of the general situation in the WIO Region.

Additional input was received from participants of the PADH and MWW Regional Task Forces meeting held in Moroni, Comoros, from 26th to 28th October 2005 as well as during the Steering Committee Meeting in Mombasa on 7th March 2006 and from the WIO-LaB Project Management Unit team.

2.0 EDUCATIONAL INITIATIVES AND NEEDS IN THE PARTICIPATING COUNTRIES

2.1 KENYA

2.1.1 Completed and ongoing Education Initiatives

Several respondents cited involvement in education programmes in areas related to the WIO-LaB focal areas i.e. tourism, aquaculture, coastal mining, municipal waste water management and agriculture as well as other broader issues such as fisheries.

At the University level, courses in Environmental Education and Biology where aspects of tourism and municipal waste water management are taught is evident from the curriculum of the Catholic University of Eastern Africa (CUEA) and other universities.

Involvement of government institutions such as Kenya Marine and Fisheries Research Institute (KMFRI) were focused on a course on responsible aquaculture and ecotourism in mangroves as an alternative livelihood run in 2001 and funded by SEATRUST and World Wide Fund for Nature (WWF). The International Ocean Institute (East Africa) (IOI-EA), based in KMFRI indicated that it provides support to the construction of mangrove walkways for community based ecotourism and training of guides as well as involvement in Coastal Cleanup at both local and national levels. Funding for IOI-EA activities come from the International Ocean Institute and WWF-EAME.

The Coast Development Authority (CDA-ICAM) has been involved in educating beach operators in the tourism sector, working with community based organizations in

aquaculture activities and supporting farmers field schools in the agricultural sector. Funding for these programs comes from USAID, FAO and other donors.

Several NGOs are active in the field of Environmental Education. The Local Ocean Trust/Watamu Turtle Watch has activities that cover information dissemination through marine information centers (targeting turtles), promotion of eco-friendly mariculture initiatives, involvement of schools and local community groups in beach clean up days, lectures and awareness activities. Education activities of Local Ocean Trust/Watamu Turtle Watch were funded by the East African Wildlife Society

Eco-Ethics indicated involvement in working with communities to tap monetary benefits from tourism related ventures, support to aquaculture programmes, establishment of Eco Clubs in both local primary and high schools which work to create awareness and take appropriate actions concerning the effects of coastal mining especially quarrying as well as municipal waste water management. Eco-Ethics is supported by the Eco-Ethics International head office and individual and company sponsorship.

The Kenya Sea Turtle Conservation Committee (KESCOM) indicated involvement in tourist education programs on sea turtle conservation as well as outreach activities to schools on the benefits of clean beaches and good waste management. KESCOM receives funding for these activities from World Wide Fund for Nature (WWF) and the United Nations Development Program (UNDP).

Input from WWF-Kiunga Project indicated that the project is active in raising awareness on coastal mining and solid waste management through community workshops and seminars as well as school and village activities. Funding for these activities come from USAID, WWF-Networks and individual donors.

Nature Kenya is also involved in education programs targeting the tourism and agricultural sectors at the Arabouko-Sokoke forest. In terms of tourism, training of community tour guides is undertaken and the guides are equipped with knowledge on biodiversity, interpretation skills, customer care and entrepreneurship. Funding for these activities comes from donors with staff volunteering in different activities.

Education activities conducted by Wildlife Conservation Society (WCS) range from support to the marine environment day, the International Coastal Cleanup and stakeholder awareness seminars for fishers and resource managers from the Fisheries Department.

A report from ProZim Society (Ater, 2005) highlights the activities of organizations such as A Rocha Kenya, Lafarge Ecosystems, Mwamba Conservation programme, Wildlife Clubs of Kenya, CORDIO-EA, East African Wildlife Society, KESCOM and Kenya Wildlife Service that are involved in education programmes. A Rocha Kenya is a Non Governmental Organization that focuses on bird surveys. Part of A Rocha Kenya's outreach programme involves school visits by an Environmental Education Officer to schools adjacent to Arabuko Sokoke and Mida Creek. There is a plan to develop a

package that primary school teachers can use in Science and Geography classes as well as plans to train forest guides to conduct environmental education in primary and secondary schools in 2006 (Ater, 2005). Funding to A Rocha Kenya's programmes come from the UK office guest house facilities, and collaboration with the Turtle Bay hotel which receives donations from hotel guests.

Lafarge Ecosystems, which is a subsidiary of Bamburi Cement, is involved in a green schools programme, which provides tree seedlings to schools (Ater, 2005). This programme enhances the conservation awareness of the students and teachers. This programme is funded through Bamburi Cement (Ltd) as part of its outreach programmes. The activities of Mwamba Conservation Program are also highlighted by Ater (2005). Mwamba Conservation Program is supported by Camps International and its awareness programme is being developed to target local communities and members of the public. This programme uses school team expeditions and students doing their gap year to assist in school community projects, beach clean ups and environmental education programmes (Ater, 2005). Funding for this programme comes from students on their gap year and donations for school building projects (Ater, 2005).

Wildlife Clubs of Kenya (WCK) have a national focus with offices in different parts of Kenya and education activities are conducted through Wildlife Clubs in schools. WCK also has a College of Tourism Training and Research based in Nairobi. WCK member schools are visited by mobile education units and this organization is also involved in marine environmental days, World Wetlands day and the International Coast Cleanup Campaigns (Ater, 2005). Although WCK do not have a community outreach programme it partners with the Kenya Sea Turtle Conservation Committee (KESCOM) and Kenya Wildlife Service (KWS) which have coastal community educational programmes. Funding for WCK activities comes from membership fees, hostel fees and fees from college training (Ater, 2005). The East African Wildlife Society (EAWLS) is also involved in education outreach within its varied programme areas ranging from Water Catchment conservation, Ecotourism, Wetland and Marine Resources Conservation (Ater, 2005).

2.1.2 Support to curriculum development

Direct support to curriculum development was indicated by the of Local Ocean Trust/Watamu Turtle Trust which has an education programme specifically aimed at school children and the local community in raising public awareness to marine conservation and the direct benefits of applying sustainable resource use practices. This programme also extends to the tourists and visitors to the Watamu area. Eco-Ethics indicated that they were collaborating FEE (Foundation of Environmental Education and Kenyatta University) in the field of curriculum development based on their experience with the Eco Clubs, which have been in place for 5 years and are providing useful input into this process. The project manager of WWF-Kiunga indicated involvement in the development of curriculum for the Higher National Diploma and Bachelors of Technology in Tourism at the Kenya Institute of Education. Nature Kenya also develops

curricula for its schools programmes. Although IOI-EA is not involved in curricula development, they indicated that they hope to include it in their 2007/08 workplans, subject to availability of funds.

2.1.3 Development of awareness materials

The input from Eco-Ethics indicated that they have several awareness materials that target different age groups and are based on the message and action desired. Common materials used are posters, graffiti, crafts, and models. In their capacity building programs with artisanal fishers, experts are allocated a few hours to share their experiences with the stakeholders and create opportunities for information dissemination. Presently the Watamu Turtle Watch have hand outs, slide shows and use art classes which utilize natural resources such as the beach sand to depict for example the life cycle and threats to sea turtles. WCK produce the *Komba* magazine whereas KESCOM produces an awareness newsletter (*Kasa News*) as well as information brochures and posters for awareness. CORDIO-EA has produced awareness posters for circulation to stakeholders. KWS has also participated in the release of posters to create awareness in various marine conservation topics. Nature Kenya produces material targeting science teachers in primary schools. WCS is involved in the production of reports, books and scientific publications targeting students, resource managers and marine and coastal scientists.

2.1.4 Training programmes for teachers on WIO-LaB focus areas

There have been mangrove awareness and outreach programmes targeting teachers conducted by the Wildlife Clubs of Kenya. Additionally, the Eco-clubs coordinated by Eco -Ethics are driven by school teachers and pupils. In some cases university students have formed integral components especially during environmental clean-up campaigns. The only organization focusing directly on teacher training is ProZim, which has held annual teacher training programmes in Mombasa from December 2003. Primary school teachers from the Coast province are the target group and they are trained in various aspects of Environmental Education (EE) using group work, assignments, talks by experts, excursions and school projects. Input from ProZim Society, indicated teachers undertake tours to Mombasa Marine Park during the course and attend lectures on history of Mombasa Marine Park, waste management in schools & beach clean up activities for teachers, lectures in soil profiles, food webs, tree planting and linkages between the land and the sea. Support to ProZim was from CORDIO-EA and Lafarge EcoSystems and these teachers are expected to pass on the information gained to their students.

Input from KESCOM indicated that though it does not run training programmes it collaborates with other organizations such as WCK and Baobab trust for training purposes. WWF-Kiunga runs school teachers workshops and science teachers form the target group for these activities while Nature Kenya occasionally runs biodiversity courses.

2.1.5 Training support for professional guides in Marine Protected Areas

This was identified as priority area by all respondents as it is important to ensure the teachers and students visiting the MPA's obtain correct information. Watamu Turtle Watch indicated that they provide support and training of professional guides who work within the MPA as eco-tour guides. However, Marine Protected Areas are under Kenya Wildlife Service (KWS) who have their own trained Education Officers.

2.1.6 Priority areas for education awareness and recommendations

In Kenya, priority areas for education awareness were cited as solid waste management, habitat destruction, coastal mining, policy and legislation awareness. These areas fall within the WIO-LaB Project thematic areas. The respondents felt that the public at large is generally unaware of the detrimental effects of solid waste to the environment and ultimately themselves. In the case of habitat destruction, the public is generally aware of the effects of habitat destruction on the environment and often are forced by simple economics to destroy areas of land and forest without being taught feasible alternatives.

Coastal mining was considered to be degrading and widespread along the Kenyan coastal strip and the case of coral limestone quarries, which are left open after the excavation of building blocks, was cited as an area of concern. Ports and harbors were also considered to be a major source of pollution. Policy and legislation awareness was considered to be important, as members of the public are unaware of legal rights and responsibilities in relation to protected areas. Policies and legislation on coastal management were also considered to be weak and not well understood especially within government authorities and departments.

It was felt that awareness and education about solid wastes should go beyond schools and their pupils to public officers, institutions (like municipal councils, hotels, and industries) and their support should be enlisted as well. Funds for these activities should be generated from within, especially from the hotels and industries that benefit from these areas. The Blue Flag concept was also encouraged. It was felt that National Environmental Management Agencies should support grassroots' initiatives and infuse their strategies from the ground to make implementation cost effective and acceptable. With regards to MPA's, a need for greater stakeholder consultation and participation in management decision-making was recommended.

It was also felt that services of extension workers in agriculture, fisheries and forestry were lacking, the enforcement of fisheries laws and operational plans for resource utilization. Negative attitudes were seen as the larger problem and not the lack of

awareness in communities. Respondents felt that the fact that land based activities which impact the marine environment are those in the interior of the country, the target groups for education and awareness should be those up country. It was felt it is hard to get funding particularly when one is to conduct the training in the rural areas and it was suggested that the WIO-LaB project should work towards enhancement of environmental education in the rural areas/up country regions.

With tourism being the most important economic sector in Kenya, its impacts in terms of pollution should be considered. It was also emphasized that awareness should be raised on the impacts of land based sources of pollution on key ecosystems such as coral reefs, seagrasses and mangroves. As the fishery sector is also considered to be a key sector for local livelihoods, it was considered to be important to raise awareness on the connection between fishing, pollution, fisheries management and marine protected areas.

2.2 TANZANIA

2.2.1 Completed and ongoing Education Initiatives

The education assessment in Tanzania revealed that the National Environment Management Council/ Tanzania Coastal Management Partnership (NEMC/TCMP) has been spearheading an environmental communication strategy through the Coastal Environmental Award Schemes (CEAS). The aims of CEAS are to increase awareness about the coastal environment, promote public participation in management of natural resources at the coast, and encourage the use of environment friendly technologies and practices, to demonstrate government commitment to integrated coastal management (ICM) programme. This award scheme aims at enhancing meaningful involvement of coastal inhabitants in coastal development processes and ensuring that they participate in the implementation of coastal management policies (Swai et al. 2000).

This has been used successfully to increase public awareness and participation in environmental management and protection. People from all walks of life are motivated to carry out projects and activities which benefit themselves and the environment. Colorful annual awards presentation ceremonies that are held in coastal districts usually around June 5th - the World Environmental Day (WED). Participants in CEAS work independently or collectively to better manage natural resources and not only help themselves, but serve as models for others. In the process, they also receive recognition, and the winners receive awards. The purpose for CEAS is to:

- (a) Increase environmental awareness, specially in the management of natural resources
- (b) Promote public participation in environmental protection
- (c) Encourage the use of environmentally friendly practices and technologies
- (d) Demonstrate government's commitment to environmental protection
- (e) Reward individuals and groups who carry out appropriate resource management practices.

Participants of CEAS work to manage their resources and those that excel in utilizing appropriate resource management practices receive awards. Activities undertaken include tree and mangrove planting, mariculture, clean up activities, advocacy, promotion of good agricultural practices, solar use, sea weed farming, raising awareness through creative arts such as songs, plays etc. Fundraising for the awards and other related activities is done by building local partnerships with individuals and local organizations and from local governments which ensures sustainability of the activity (Swai et al. 2000). The awards ceremonies give decision makers a chance to talk about the wise management of resources and the ceremonies also provide a platform for high profile elected officials to show their support for the winners and for coastal management processes (Swai et al. 2000).

CEAS, is also expected to increase and strengthen participation and collaboration of government and private sectors. Moreover, increased interest and use of public media for environment and building capacity at institutional and individual level are among the expected outputs of the programme.

The Tanzania Institute of Education (TIE) and national environmental agencies such as the National Environment Management Council (NEMC) in collaboration with Tanzania Coastal Management Partnership (TCMP), have been implementing relevant activities on education curriculum development. An example of this is the introduction of Ecological Friendly School Strategy (ECOFRESS), which involves a sample school from special education inspectorate zone selected over a specific time. Additionally, organizing a competition per year around school conservation activities such as school hygiene and water and sanitation could be part of school curriculum. These are types of school curriculum activities developed by the Institute of Education in Tanzania.

2.2.2 Recommendations for support to educational programmes

There is an opportunity to support school activities such as competitions, open days, environmental clubs, visits to MPAs and theme parks, etc. Sensitizing curriculum developers on environmental education and how to promote teachers ability to teach the integrated environmental education (EE) was pinpointed as one of the areas for WIO-LaB Project intervention. Monitoring tools for the process of teaching environment and sustainability at primary to teacher training colleges by selecting a sample of institutions and a schedule for implementation could best support the curriculum development.

There are also opportunities for the development of awareness materials through production of school programmes for promotion of environmental conservation through electronic and print media (TV/radio, newspapers, newsletters, etc), production of fliers, environmental calendars and posters. In addition, the development of support materials for EE can be through the translation of the textbook *Marine Conservation for primary*

schools in countries of the Western Indian Ocean (Francis *et al.*, 2000) into Kiswahili. In this area, a secondary school manual could also be produced.

Training of school teachers on LBA themes could be carried within the context of teacher training courses run by the Ministry of Education and the themes should be identified from topics in the curriculum syllabuses. There is also a need to develop activities for World Environment Day (WED), implement Environmental Education (EE) and LBAs awareness workshops for secondary schools.

It was also felt that support to professional guides for school programmes in Tanzania could best be achieved through production of guide for education practitioners on various aspects related to environmental legislations/acts and MPA's

2.2.3 General recommendations

The survey in Tanzania did not provide specific targets areas for education awareness but it provided useful information of methods that can be used to input into curricula and to raise awareness of communities to different issues that impact the marine environment.

Increasing the awareness coastal issues could be achieved through enriching school education curriculum with relevant activities which support or contribute to the WIO-LaB activities and objectives such as introduction of Ecological Friendly School Strategy (ECOFRESS), school competitions, CEAS and WED. Translation of the textbook on *Marine Conservation for primary schools in countries of the Western Indian Ocean* into Kiswahili language will enable it to fit into the primary school curriculum, and have tremendous input in developing the educational programme. Awareness raising, EE and LBAs workshops in secondary schools will also be relevant. Support to MPA's to train professional guides for schools should be practiced through production of a guide for education practitioners on various aspects. The success of this exercise will be achieved if a strong collaboration is built between the TIE and WIO-LaB-PMU when developing the training programme. Also, in collaboration with other academic departments and stakeholders, an emphasis should put on frequent monitoring, evaluation and reviewing the curriculum.

2.3 COMOROS

2.3.1 Completed and ongoing Education Initiatives

In the Comoros, the Institute of Education (IFERE) has been responsible for research on education programmes and outreach methods in environmental education since January 2002. The National Directorate of Environment in collaboration with the Ministry of Education conducts some activities for education and sensitisation purposes in environmental issues. There are also several national and regional projects that had

environmental education component. The project PRE COI/UE which ran from 1995-2000, had implementation of integrated coastal zone management activities as one of its core activities. There were several meetings and sensitisation activities concerning problems of the marine and coastal environment that were organized in the Comoros. Educational and awareness activities concerning coral reefs, sea turtle biology and solid waste management were undertaken. An environmental project by FAO in 1995, also conducted sensitisation activities and developed posters on protected areas. A project based on the conservation of biodiversity and sustainable development by UNDP from 1998 to 2003 focused on management, sensitisation of the population and putting information systems in place for environmental education. To celebrate the World Environmental Day, the National Department of Environment organizes poetry and design competitions as well as talks with local communities.

2.3.2 Support to curriculum development

The project “Appui Régional à la Promotion d’une Education pour la Gestion de l’environnement (APERGE)”, which is coordinated and supported by the Indian Ocean Commission (IOC), is run in the Comoros as well as other island states. The project aims at the development of environmental education material for schools based on the needs identified in Comoros and the other island states and to develop EE in a coherent manner in the member states. Part of the programme involves training of teachers and providing them with educational material for their outreach activities. These activities may be eventually integrated into the curriculum.

2.3.3 Development of awareness materials

There is a diverse assemblage of material available on environmental issues developed by different projects in Comoros. Awareness material produced ranges from radio and television programmes, posters, information boards, t-shirts with environmental messages, periodicals and educational bulletins, specialized journals dealing with problems, debate conferences, botanical gardens and cultural villages. The environmental project by FAO in 1995, generated posters on marine protected areas which were distributed to many schools and institutions. A project based on the conservation of biodiversity and sustainable development by UNDP from 1998 to 2003 produced an information bulletin entitled *Mwana wa Gnamba* which was distributed to schools. Projects on climate change produced sensitization material for distribution to certain institutions and education establishments.

2.3.4 General recommendations

In Comoros and especially the Grand Comore, environmental education is a recent activity that demands attention on the part of educators. It is important to note that environmental education was introduced at the primary school level in 1996 under the science and environment studies. Colleges and schools that teach science, geography and

other disciplines should introduce environmental issues in their respective courses. At the university level courses on environment management are also taught. It is apparent that the priority areas for focus in Comoros are waste management, studies of environmental impacts, marine biology and oceanography, laboratory techniques, environmental protection, sustainable extraction of coastal resources, protection of habitats and sensitization.

The initiatives of ARPEGE ought to be encouraged and their training needs to be supported and effective methods of teaching should be proposed. It is also necessary to ensure the reinforcement of primary education dealing with the environment and effective application by the local community.

2.4 SEYCHELLES

2.4.1 Completed and ongoing Education Initiatives

Public demands for a safe and healthy environment has increased significantly and environment issues have attracted public interest in Seychelles. The media such as television, radio, magazines, and newspapers lead environmental preservation campaigns. The Government has taken the initiative on environmental protection movements by increasing public awareness over environmental issues e.g. through different campaigns under themes such as: Save the turtles and National Park Days. The Government conducts many programmes to inform the general public about the environment and to encourage them to lead environmental friendly lifestyles through distribution of leaflets, articles, brochures and audio – visual information.

Some of the programmes of environmental education activities undertaken by the Environment Ministry are often organized and implemented in close collaboration with other Governmental, Non-Governmental, Parastatal Organizations, Private Sectors and private individuals. Beautification of Schools is one of the programmes conducted by the government. The National Beautification Campaign, initiated in 1996 by the Ministry of Local Government with the aim of promoting cleanliness and beautifying all districts including public areas was adopted by the Ministry of Environment in 2000 and all schools on Mahe, Praslin, La Digue and Silhouette are involved. National Beautification Campaigns have also extended to the District and household level. This national project was launched during the National Day celebration of 1999 by the Ministry of Local Government. It was aimed to encourage Seychellois people to upgrade the level of their residences and surroundings through cleanliness and embellishment.

The GREENLINE, available at telephone number 722111 from 8.00am to 9.00pm seven days a week. It is aimed at providing a service to the general public by means of receiving and forwarding environmental complaints/concerns to responsible staff members within the ministry or other responsible departments for investigation and immediate action, when need be. The GREENLINE is also one of the means whereby

environmental education is conveyed, through advice often given to whoever makes use of the service.

The campaign initiated by Solid Waste and Cleaning Agency (SWAC) guides schools on how to properly manage their wastes through talks which are delivered on a scheduled basis. The children together with their teachers are encouraged to adopt the 3Rs, i.e. to REDUCE, REUSE & RECYCLE their wastes at the schools and to further adopt these attitudes in their homes and communities. In certain schools, new policies are adopted whereby some children act as Environment Wardens and fine colleagues who litter the compound.

The Environment Ministry has throughout the campaign worked in close collaboration with the parent Ministry to enable efficient implementation through provision of support and education.

The training of farmers is also conducted with constant evaluation of agricultural practices as well as the Farmer's Training Centre's curricula, with the aim of constantly reviewing their programmes in order to improve sustainability of farming in Seychelles. Matters concerning proper handling of pesticides and their environmental impacts, upgrading of agricultural techniques, farm development, pig & cattle production, quality of outcrop are discussed.

The Eco-home competition was launched in 2002 at the initiative of the Eco-Home Committee (which comprised of members from different Organizations) under the direction of the Environment Ministry. This committee has the aim of increasing awareness and understanding on the need to reduce the use of harmful chemicals and technologies. As a result of such initiatives, the committee had the aim of promotion of a healthier and safer living environment within the homes in view of the fact that today many of the environmental problems are directly linked to people's attitude towards the environment and their lifestyles.

A Packaging and Disposal Competition has been initiated by the Seychelles Marketing Board in close collaboration with the Ministry of Environment, Ministry of Education and Youth and the Ministry of Local Government. Its main objective is encouraging proper waste management, at different categories: Small and Medium Sized Retailers (SMB Retailers), District Administration and Schools. Half – sized metal barrels with a lid, painted green (made in Seychelles) sponsored by SMB were distributed to the participants and regularly monitored. Users were constantly sensitized towards the best approach in proper maintenance of those bins as well as that of their surroundings (bin sites). The extent of application of the 3Rs (Reduce, Re-use and Recycle) of wastes was a vital criteria during the judgment of the competition.

The Youth Festival is held every year and it is celebrated during the month of August. The Environment Ministry has this year played a major part in the implementation of the festival at the demand of the youth. Activities such as tree planting have been greatly appreciated by the youth.

Environmental Theme Days are celebrated throughout many countries around the world, which form part of Organizations such as UNEP, FAO and others. To commemorate these in Seychelles days, various activities are organized every year such as media sensitization campaigns, rallies, marches, talks, trail walks, field trips, exhibitions, displays, competitions and much more.

The Seychelles Marine Parks Authority (SCMRT-MPA) implements its educational and awareness initiatives in collaboration with other Ministries, and Non Governmental Organizations (NGO's). Through classes, educational trips, presentations, snorkeling sessions and guided tours, the SCMRT-MPA aims to teach young people about their protected marine environment and its varied habitats. This leads to a greater appreciation of the delicate balance of ecology and the importance of conservation and sustainable use of marine resources.

The Wildlife Clubs of Seychelles (WCS), an NGO for young people was formed in 1994 and is dedicated to promoting conservation action through environmental education. Today there are about 800 children throughout Seychelles who belong to Wildlife Clubs. Wildlife Clubs of Seychelles is run by volunteers. Most of the clubs are led by teachers and staff, as well as some parents and community volunteers.

Nature Seychelles supports WCS by providing a coordinator, office space, funding and project support. WCS have also organized over 30 leader seminars and workshops to promote teachers' interest and understanding of environmental issues and environmental education. Activities planned include field trips, snorkeling, trips to nature trails to study and observe endemic and native plants and designing education materials. The emphasis is on interpretation and active learning.

The Wildlife Clubs Festival is held in June to celebrate the anniversary of WCS. Activities are organized at Roche Caiman Bird Sanctuary and include marsh and beach surveys, plant identification and bird watching. Every June, on Environment Day, clubs are rewarded for the good work carried out during the previous year. Best Clubs awards are presented to clubs in three categories - Primary level, Secondary level and Post Secondary.

A hands-on programme to encourage individual clubs to protect, study and restore wetlands, forests, protected areas and other natural ecosystems are run close to where the clubs are located. The year 2003 was the United Nations International Year of Freshwater (IYFW). WCS was appointed by UNESCO as the focal point for IYFW in Seychelles. WCS has initiated 'STREAM TEAMS', a registered programme to engage clubs in monitoring the health of local streams and rivers and continue to care for them.

Nature Seychelles implements exciting activities through a wide ranging and integrated program called SPLASH (Special Program for Learning and Awareness on Species and Habitats).

The APERGE (Appui Régional a la Promotion d'une Education pour la Gestion de l'environnement) Project, which is coordinated and supported by IOC (Indian Ocean Commission), was launched in 2003 is based on international networking for the development of EE in schools. This also involves Mauritius, Madagascar and Comoros. Seychelles also participates in the UNESCO international forum Small Island Voices, where schools from small islands in the Pacific, Atlantic and Indian Oceans share information on a variety of development issues through the internet.

2.4.2 Support to curriculum development

The Government of Seychelles recognizes the importance of Environmental Education (EE) and is supportive of initiatives in this area as reflected by the Environment Management Plan for Seychelles 2000-2010, which has environmental education as a key theme. It is the policy of the Seychelles Ministry of Education to promote the integration of environmental education across the curriculum, and to support extra-curricular environmental initiatives in schools. It chairs the National Environmental Education Coordinating Committee which includes representatives from various ministries, parastatals and NGOs. Designated staff in the Ministry itself and in the National Institute for Education (teacher training college) are responsible for coordinating environmental education related projects for schools. A number of parastatals, including the Marine Parks Authority and the Solid Waste and Cleaning Agency are also involved in EE programmes. The Ministry of Education and Youth has the mandate for formal education in schools. In order to achieve that, in 1996, the Environmental Education Coordinating Committee (EECC) was formed with the aim of assisting the ministry to coordinate this process.

The Ministry of Education is responsible for curriculum development. Specifically the National Institute for Education has the mandate to develop and evaluate curricula. The NIE offers a 9 week compulsory course in EE for its pre-service teachers. This course covers an introduction to basic ecology and environmental issues as well as an introduction to the theory and practice of environmental education. It also coordinates other short training courses in EE topics for both pre-service and in-service teachers. These have been facilitated by external organizations such as Nature Seychelles, Wildlife Clubs of Seychelles and Shoals of Capricorn (a previous NGO focused project on marine science and education).

A cross-curricular approach to environmental education from crèche to post secondary has been adopted in order to reinforce a holistic understanding of the environment and related problems. Regular workshops are organized for in-service teachers and Wildlife club leaders in order for them to acquire knowledge and understanding of ecological issues and skills needed in order to provide similar opportunities for the children.

2.4.3 Development of awareness materials

More than 10 education publications on different environmental issues have been produced and donated to promote and support environmental education in clubs and schools. To sustain the long-term future of environmental education in wildlife clubs requires 'multiplication' mechanisms by primary, secondary and post secondary school staff as Club leaders.

SCMRT-MPA has been instrumental in developing a series of educational materials that support the school curriculum. This includes the publication of educational materials such as codes of best practice, fact files and informational booklets for teachers and students alike.

In one of the most exciting environmental education outcomes ever achieved in Seychelles, Nature Seychelles and the Ministry of Education have produced a textbook called *Learning for Sustainable Living in Seychelles*. Designed for lower secondary schools, but also useful for any others interested in the natural environment, it encourages learners to revisit individual practices and adopt lifestyles that have a sustainable impact.

Nature Seychelles also produces *Zwazo*, a full colour, environmental magazine. Produced bi-annually, it is circulated free to Nature Seychelles members, policy makers, the private sector, teachers as well as international organisations. Newsletters, leaflets, pamphlets and posters are also produced and distributed. Nature Seychelles staff share knowledge via radio and television programmes on a regular basis, presently contributing to three radio programmes, including a children's programme, weekly articles in national newspapers, features in national news and articles in magazines.

Public lectures and displays are held in the Centre for Environment and Education and elsewhere on Mahe, Praslin and La Digue. Mobile displays and kits are carried across the island for this purpose through Roving Environmental Education Facility (REEF). Nature Seychelles uses innovative methods of getting the environmental message across such as the production of calendars for the private sector, assistance in the design of postage stamps, introduction of environmental messages and text in documents, sponsorship of environmental t-shirts for national events, and sale/donation of biodiversity-related products such as postcards, canvas bags and enamel pins.

2.4.4 General recommendations

Although there are several ongoing educational activities in Seychelles there are still areas that WIO-LaB Project can support such as workshops for teachers, development of awareness material, support for Marine Environmental days, as well as the area of curriculum development.

It is recommended that the WIO-LaB Project education programme integrates these areas through input into curricula, production of teacher's guides and MPA guidebooks and

environmental education. These emerging issues already form part of the educational needs identified in the WIO region and advancing education awareness in these areas would still be in line with WIO-LaB Project goals.

2.5 SOUTH AFRICA

2.5.1 Completed and ongoing Education Initiatives

Many organizations and facilities in South Africa contribute towards creating awareness on environmental issues. The internationally based Foundation for Environmental Education (FEE) appoints organizations in countries to facilitate various programmes, such as Eco-Schools (for schools), Blue Flag (for beaches and marinas), Young Reporters (for Secondary Schools), Learning about Forests (for schools) and Green Key (for hotels, campsites etc.).

In South Africa, the Wildlife and Environment Society of South Africa promote and organize both Eco-Schools (also supported by the government through the Department of Education) and Blue Flag. Blue Flag is also linked closely with municipalities who achieve Blue Flag status.

A government initiative that promotes awareness and encourages youth to enter into science, engineering and technology careers is the Department of Science and Technologies (DOST) and the Department of Education (DOE) under the DINALEDI schools programme. There are 400 appointed schools across South Africa. These schools focus on science and mathematics in their curricula and are excellent for introducing and piloting content at a secondary school level.

From a government level the Departments of Science and Technology and Education have signed a memorandum of understanding and agreement to collaborate on programmes and projects, the implementing agent is mainly the National Research Foundation (NRF) business unit; South African Agency for the Advancement of Science and Technology (SAASTA).

The Two Oceans Aquarium (www.aquarium.co.za) offers education programmes for both students and workshops for teachers. The focus is on different age groups ranging from pre-schoolers to senior school students in Grade 12. Resource material is also available from the website. The Aquarium has an environmental education centre which is fitted with equipment that gives students an opportunity to touch plants and animals as well as to view microscopic organisms.

Port Elizabeth Museum at Bayworld has an education department, which employs educators through the South African Department of Education. The focus of their education programs is primary schools in the Nelson Mandela Metropolitan, Eastern Cape area.

2.5.2 Support to curriculum development

The introduction of the General Education and Training (GET) Band and the Further Education and Training (FET) Band in 2005/6 brought with it a need for new and local content. The content has to be linked with the curriculum as set out by the Department of Education for it to be of use. Trends have shown that ad-hoc information handed out is of little use and therefore needs to go hand in hand with training opportunities for the effective implementation of the content in the curriculum to achieve the stated learning outcomes. Again there are organisations and projects that contribute content and support materials to the curriculum and offer training with it. However, content that deals directly with land based activities and influences on the marine environment is limited with the focus on inland activities and its immediate effects. There is an emphasis on global warming and effects of pollution on global warming.

In the South African survey, an assessment of school based education and training needs was undertaken and the responses indicated that the senior phase (grade 7-9) are best suited as a focus group for educational materials. The three learning areas in the Revised National Curriculum Statements, which rated the highest, were Natural Sciences, Technology and Social Sciences. Media (articles and radio) and television programmes (documentaries and children's programmes) rated the highest for creating awareness. Grade 7 and up are targeted, because they are about to select subjects and entry into mathematics, science and technology is encouraged. Grade 10 – 12 learners are targeted through Science, Engineering and Technology Career Awareness Campaigns, encouraging entry in science and technology careers. Grade R – 6 are considered feeder grades and the focus would be on improving maths and science literacy.

2.5.3 General recommendations

Many organisations and facilities in South Africa contribute towards creating awareness and are capable of using information to facilitate expositions and create awareness of land based activities. Limitations are often their own human resource capacity and finances. WIO-LaB Project could make important contributions to preparation of permanent displays at facilities such as environment centres and museums with a strong educational focus, together with support materials such as posters for classrooms, flyers and children's stories. Centres would then be able to assist school environmental clubs and special days/weeks on the environmental calendar, such as National Marine Week and International Coastal Clean up Week.

The most applicable programmes that would link to WIO-LaB Project training and educational initiatives would be Eco-Schools and Blue Flag, with some links to Green Key (not prominent in South Africa) for campsites and hotels close to water ways and beaches.

Cost effective teacher resource packs that could be distributed with posters pertaining in particular to the topic at hand are recommended. It was recommend that awareness materials should be produced collaboratively so as not to duplicate effort made by other organisations. Also recommended is the training of educators to implement the materials into the curriculum. Working in collaboration with the Department of Education supporting the “National Strategy for Mathematics, Science and Technology Education” is essential.

3.0 RECOMMENDED AREAS FOR SUPPORT TO EDUCATION PROGRAMMES

From the input received, it is obvious that some countries in the WIO region have more advanced environmental education programmes and this provides scope for sharing of experiences amongst the countries in the region. Following are some recommendations from the educational assessment survey, where it is recommended that WIO-LaB Project provides support to school and public awareness programmes, the development of awareness materials and increasing the participation of the countries in the Blue Flag programme. These recommendations are based on the recommendations made by each of the participating countries and also include other suggestions for strengthening participation of stakeholders within the different countries.

It is clear that most countries already have awareness programmes both for students, teachers and the general public. Therefore priority should be given to those countries that their awareness programmes have not being institutionalized.

3.1 Public Awareness Campaigns

Based on the experiences drawn from some of the countries in the region have shown that beach clean-up campaigns for Kenya and Coastal Environmental Award Scheme (CEAS) for Tanzania have been instrumental in raising awareness on environmental issues as well as engaging different stakeholders in environmental management. While both are recommended to the WIO-LaB project for implementation, priority should be given to the supporting beach clean up campaigns as they may not require as much resources to set them up as CEAS would require.

3.1.1 Beach clean up campaigns

Coastal and marine environment particularly beaches are an important attraction to tourists visiting the WIO region. Most of the tourists visiting countries such as Mauritius, the Seychelles and to a large extent Kenya and South Africa, are attracted by their beautiful beaches, clean waters and coral reefs. Sustainability of the tourism industry in

these countries is dependent on maintaining clean beaches, clean waters and healthy coral reefs and its associated ecosystems.

Recognizing the importance of these beaches to the tourism industry, regular beach clean up campaigns are organized. For example, in Kenya annually, Coastal Cleanup campaigns are organized as part of the International Coastal Cleanup day which is a worldwide activity. The International Coastal Cleanup day was initiated in 1986 by the Ocean Conservancy (see www.oceanconservancy.org). In Kenya, the Baobab Trust coordinates the organization of this activity in partnership with hotels, government institutions, banks, cleaning companies, diving schools and private firms. These partnering institutions make various contributions ranging from transport, refreshments, publicity material such as T-shirts and banners, tents and chairs, PA systems, boats and diving equipment, weighing balances, garbage collection bags and vehicles to transport the debris collected. Volunteers are recruited to conduct both clean ups on sections of the beaches as well as underwater clean ups by diving. The debris collected is weighed and sorted into different categories and the report compiled from the 2005 beach cleanup campaign showed that 66% of the debris on the beach in Kenya was from land based activities (Sewe, 2005). Government officials are invited to officiate the clean up campaign and there is an award giving ceremony for the best data recording school. In 2003, there was a ceremony to release turtle hatchlings to the sea therefore emphasizing the importance of environmental conservation for the survival of turtles which are prone to the ingestion of plastic debris and entanglement by discarded fish lines. Various media and publicity activities are undertaken in conjunction with the beach clean up campaigns.

It is proposed that this activity be implemented in Zanzibar and Comoros. Comoros and Zanzibar are small island states where schools and the general public may be targeted with ease. But also Zanzibar, which is becoming an important tourist attraction in the region, cleanness of its beaches is a major issue of concern. *Ad hoc* beaches as well as general Stone Town clean up campaigns organized by different groups have been held over the years. The recent campaign was organized by the Zanzibar Association of Tourism Investors and focused mainly on the clean up of the Stone Town. Comoros is another country where the cleanness of its beaches is an issue that needs attention.

As experience from Kenya has shown, the beach clean up campaign should involve other activities such as competitions for drama, arts, and others to be able to attract different sections of the society. Such campaigns should be made involving and fun for people of different age groups to be attracted to attend. Depending on how successful they are, they may attract attention of the local politicians, decision-makers and representatives of private sector.

The general objective of the proposed public awareness campaigns is to raise awareness on environmental issues to different groups through beach clean-up campaigns that will also include other activities such as drama, dhow competition, etc. These campaigns will not only lead to cleaner beaches but also will provide opportunity to engage the students and their teachers, government institutions as well as private sector in environmental issues.

Proposed specific activities

As the clean up campaigns have been ongoing in Kenya, this could be used as a model for the implementation of similar campaigns in Comoros and Zanzibar. The Baobab Trust which has been spearheading the organization of the campaigns in Kenya may be consulted for further input concerning the activity and mobilization of partnerships. In the implementing countries, the Department of Environment could be used to lead the campaign and provide leadership. Additional activities that may be integrated into the campaign are competitions in poetry, drama, boat races and beach art. The WIO-LaB project could use the week prior to the clean up to raise awareness of issues related to land based activities and their effects on the marine and coastal environment. Resource packs could be developed for teachers with posters dealing with particular WIO-LaB Project focal issues stressing the impact of upland activities on coastal ecosystems. These packs could be distributed to teachers within Wildlife Clubs and schools to educate students before engagement in actual clean up activities.

More specifically, it is recommended that the WIO-LaB provide support to:

- i) Department of Environment, Zanzibar to assist it to set up a committee that will be responsibility for organizing regular beach clean-up campaigns in Zanzibar. It is recommended that the Committee be comprised of representatives of key stakeholders in Tourism sector, Environment and Education.
- ii) Department of Environment, Comoros. As was recommended for Zanzibar, support be provided to the Department of Environment to assist it in establishing a multi-stakeholders committee that will coordinate the beach clean-up campaigns in Moroni to start with.

WIO-LaB's support could take any of the following forms:

- i) Meet the core costs of initial meetings to establish the beach clean-up campaigns committees in these countries
- ii) Support study tours by representatives from Comoros and Zanzibar to Mombasa to learn about of the operations of the Coastal Cleanup campaign

Impact Assessment of the activity

Considering that there are reports of the beach clean up campaigns for the different countries that implement beach cleanup activities under Ocean Conservancy (www.oceanconservancy.org), the following aspects may be used to determine the impact of this activity:

- The number of volunteers involved in beach clean up activities
- The number of schools involved in beach clean up activities

- The number of institutions (government, NGO's, hotels and private companies) involved in the campaigns
- The trends in types of debris collected on the beach to determine whether there are changes in various categories of debris collected on land and underwater
- The trends in quantity of debris collected to determine whether there is a decline in quantity or an increase

3.1.2 The Coastal Environment Award Scheme

As discussed above, the Coastal Environment Award Scheme was initiated in Tanzania by the Tanzania Coastal Management Partnership (TCMP) and district authorities, in 1998. The Scheme became an important tool in securing the support for development of the National Integrated Coastal Environment Management Strategy at the grassroots level. It not only contributing in the creation of awareness but also in promoting learning by doing in various environmental and coastal natural resource based development activities. The awards ceremonies were held in the participating districts on the World Environment Day on June 5 and were accompanied by processions, songs, cultural performances and speeches, all advocating for coastal and marine environmental conservation.

The Scheme attracted individuals, groups, schools and institutions. The participants were involved in a range of activities from tree and mangrove planting and tree nurseries preparation to solar salt making and cleaning of surrounding, seaweed farming. CEAS covered much broader activities than beach clean up campaigns.

Financial resource permitting, WIO-LaB could explore the possibilities of assisting the countries such as Mozambique and Kenya to set up their Award Scheme. These countries may have a national framework for planning and implementation of ICM and could therefore use the Scheme to strengthen the support from different sections of communities for further development of the national ICM framework. To begin with, the Scheme could involve only one district and expanded to other districts as resources become available.

In Kenya, implementation may be through Beach Management Units (BMUs). The BMUs are small management units of fishers at the fish landing sites developed to assist communities take the lead in fisheries management (Gitonga, unpublished report). The members usually elect a management committee, which oversees the activities of a landing site (Gitonga, unpublished report). BMUs are composed of boat owners, boat crew, traders, processors, boat builders and repairers, net repairers and they aim to work with the government and other stakeholders in managing fisheries resources and improving the livelihoods of the community members (<http://lvfo.org>)

In Kenya, BMUs may be supported to participate in an award scheme similar to CEAS and implemented through the Fisheries Department and Coast Development Authority, which coordinates Integrated Coastal Area Management activities. The components of

the CEAS programme fit into WIO-LaB Project thematic areas and through this, members of the public as well as government officers and policy makers will be made aware of habitat destruction in mangrove areas and rehabilitation techniques, as well as alternative livelihoods which help shift the pressure on marine resources. Awareness of legal aspects is also imparted thereby raising the general education levels of the general communities. This approach may be used in the other partnering WIO countries.

Impact Assessment of the activity

This may be done by assessing the following aspects:

- The number of BMUs involved in the CEAS programme
- The number of activities implemented by the BMUs
- The number of institutions (government, NGO's, hotels and private companies) supporting the programme

3.2 Development of New and Revision of Existing Awareness Material

From this survey, it is clear that there is a wealth of information available in terms of already developed environmental education manuals, textbooks and awareness materials. Some of these have been used widely mostly in the countries where they were produced and proved to be useful. However, despite their usefulness, they are not known outside the countries where they were produced mainly because of limited distribution and also they have been produced in one language only.

The general objective of this component is to produce awareness materials that could be used by different sections of communities to raise their awareness as well as providing them with factual information on major issues of concerns. The materials could be in a form of textbooks for primary and secondary schools and fact sheets for decision-makers and politicians.

Two activities are suggested under this component and these are: revision of “*A School Teacher’s Guide to Marine Environmental Education in the Western Indian Ocean Region*” and production of fact sheets on topical issues.

3.2.1 Revision of Teacher’s Guide

The textbook “*A School Teacher’s Guide to Marine Environmental Education in the Western Indian Ocean Region*” prepared under the UNEP/FAO’s project on Protection and Management of the Marine and Coastal Areas of the Eastern African region (EAF/5) in 2000 has been circulated widely in the region and has been used in schools in Tanzania and Kenya.

The revised textbook would be designed in a manner that it could be used to raise awareness on various pertinent environmental issues as well as serving as a teaching guide book for primary and secondary schools to be used by as appropriate to impart knowledge to pupils in their schools.

It recommended that this book be revised extensively to include topics that are relevant to primary and secondary schools curricula in most of the countries in the region. Updating the book may require that its scope is broadened to include aspects that are of relevance to WIO-LaB project such as PADH and MWW.

The text book produced by Nature Seychelles and the Ministry of Education called *Learning for Sustainable Living in Seychelles* can used as a model for the revision of this book and it is recommended that implementation of the development process of this book is undertaken in consultation with authors of the book produced by Nature Seychelles as there is much to gain from lessons learned by those that were engaged in the process.

The translation of textbook into French, Portuguese and Kiswahili will be considered was recommended in Tanzania where it has been used widely in teaching in schools. It is felt that wider use across Tanzania would be made if it was translated into Kiswahili. Translation into French and Portuguese may also be considered.

Furthermore, for the purpose of creating a demand for the books, potential publishers that have long experience in producing educational books could be approached to determine their interest in publishing and marketing the book once produced. Marketing the book would make it more visible within the educational sector and may have an impact in driving the inclusion of marine studies into the education curricula within WIO countries where this is not the case.

The following steps are proposed in implementing this activity:

- i) Reviewing the primary and secondary schools curriculums of all countries in the region to identify topics that could be included in the revised textbooks
- ii) Develop detailed outline of the revised textbook
- iii) Approaching potential publishers that could publish and market the book
- iv) Collection of teaching materials from different countries
- v) Requesting copyright waiver from authors and publishers of the selected books and manuals, whose figures and/or photos could be included in the revised book
- vi) Writing the revised book
- vii) Production of CD/DVD and website with a resource toolkit for environmental education.

Impact Assessment of the activity

This may be done by assessing the following aspects:

- Demand for the resource packs and information CDs
- Demand for book in the different languages
- Frequency of reprinting the book to meet the demand

3.2.2 Production of fact sheets on topical issues

In ensuring that awareness on various pertinent issues are raised amongst policy and decision makers at various levels so that actions could be taken where needed, it is essential that fact sheets on these issues are produced. These sheets will summarize the issue, the current state of knowledge on the issue as well as highlight concrete actions that need to be taken.

Some of the topics that these fact sheets could cover include: coastal mining, oil and gas exploration and involvement of private sector in municipal waste water management. Lessons learnt from the demonstration projects could also be summarized into fact sheets.

The fact sheets could be prepared in collaboration with other regional organizations such as the Consortium for Conservation of Coastal and Marine Ecosystems in the WIO region (WIO-C).

3.3 Increasing Participation of the Countries in the Blue Flag Programme

In the Western Indian Ocean region, it is only South Africa which is participating in the Blue Flag programme. It joined the programme since 1991 and since then 20 beaches have been awarded the Blue Flag status. These beaches are spread across the Western Cape, Eastern Cape and Kwa Zulu Natal. The beaches fall under different municipalities.

The programme is run by the Foundation for Environmental Education (FEE) (www.blueflag.org). For a beach area to be awarded a blue flag it has to fulfill 29 criteria based on water quality, environmental management and safety and services offered at the beach. The results of these criteria are posted on the beach. A system of international juries, which includes organizations such as IUCN, is also used to certify that the criteria are met.

The implementation of the Blue Flag approach would be linked to MWW issues under the WIO-LaB Project. By supporting such an initiative, WIO-LaB Project would be enhancing awareness creation as members of the public would become aware that they have a right to certain standards of cleanliness on their beaches and that they have a responsibility to maintain these standards. Such a programme would also contribute to the well being of the environment as certain water quality standards and environmental management standards would have to be maintained for constant qualification into the Blue Flag programme.

Proposed activities

It is proposed that:

- i) WIO-LaB commission a study that will highlight the experience and lessons learnt by South Africa in implementing the Blue Flag Programme as well as the overall impacts of attaining Blue Flag status.
- ii) Through the Kenya Marine Forum and Baobab Trust explore possibilities of initiating a pilot Blue Flag programme at Nyali Beach area. Such an initiative will also involve Mombasa and Coast Tourists Association (MCTA) and other interested parties. A workshop could be organized to explore the interest of the stakeholders to be involved in the initiative. The report of South Africa's experience will be one of the background documents for the workshop.

4.0 CONCLUSIONS

This assessment has been able to provide an overview of education activities that have been conducted in the past as well as those that are ongoing in countries that participated in this survey; namely Kenya, Tanzania, Comoros, Seychelles and South Africa with application to the entire WIO region. It is clear that some countries have a higher level of government involvement in education activities whereas in other countries the involvement by NGO's is higher. Additionally, some countries have more established programmes indicating the critical need to share experiences within countries in the WIO region and to borrow ideas from such experiences. This education needs assessment provides recommendations for WIO-LaB project engagement in education initiatives in the region and it is clear that several initiatives would require partnerships with stakeholders within the different countries that already engaged in the areas that fall within the WIO-LaB project focal areas.

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ANNEX I

Terms of Reference Training and Educational Needs Assessment

1. Context

The project “Addressing Land-based Activities in the Western Indian Ocean”, also referred to as “WIO-LaB Project”, is implemented by the United Nations Environment Programme (UNEP), and is financed by the Global Environment Facility (GEF) and the Norwegian Government. The WIO-LaB Project focuses on addressing major land-based activities (LBA) in the Western Indian Ocean (WIO) Region and represents a strong partnership between the WIO Countries (Kenya, Tanzania, Mozambique, South Africa, Madagascar, Seychelles, Comoros and Mauritius). The project basically aims to achieve three major objectives: 1) Reduce stress to the ecosystem by improving water and sediment quality; 2) Strengthen regional legal basis for preventing land-based sources of pollution; and 3) Develop regional capacity and strengthen institutions for sustainable, less polluting development. The project has a four-year implementation plan (2005-2008), addressing priority issues on Land Based Activities in the Western Indian Ocean Region. The project is executed within the framework of the action plan of the Nairobi Convention, and is furthermore meant to serve as a demonstration project for the UNEP Global Programme of Action (GPA) for the Protection of the Marine Environment from Land-Based Activities (LBA).

Within the context of its third objective, the WIO-LaB Project Management Unit (PMU) wishes to execute an assessment of training and educational needs in relation to its activities and objectives in the WIO Region. The Training and Educational Needs Assessment should lead to the development of a Training and Educational Programme which should serve (i) to develop the capacity required in order to effectively implement the various project activities, (ii) ensure that the capacity of stakeholders in the region to effectively manage and control the impacts of land-based activities on the coastal and marine environment is increased, and (iii) the increase awareness of the general public on the importance and means of addressing the impacts of land-based activities to the coastal and marine environment, through the development and implementation of, and support to existing educational programmes.

2. Overall responsibility

The overall responsibility of the Contractor is to assist the WIO-LaB Project Management Unit (PMU) in the execution of a Training and Educational Needs Assessment related to the activities and objectives of the project.

The Contractor will also be responsible for the development of a Training and Educational Programme for the project, in close cooperation with the WIO-LaB Project

PMU, UNEP/GPA, the Nairobi Convention Secretariat and other key regional stakeholders. The specific duties and responsibilities are defined in section 3 below.

3. Duties and responsibilities:

A. Determine training needs on LBA in the project countries:

The Contractor shall:

- Identify training needs for different categories of stakeholders including Legislators; Decision makers; Private sector; Community groups, etc., through review of prior assessment work and experiences, where available, and through Training Needs Assessment Surveys where such is not available¹;
- On the basis of the results of the Training Needs Assessment survey, select priority training requirements for the region addressing LBAs;

In doing so, the Contractor shall:

- Interact directly with National Focal Points for the WIO-LaB Project including members of the various Task Forces established by the project namely, Municipal Wastewater (MWW) Task Force, Physical Alteration and Destruction of Habitats (PADH) Task Force and Legal and Technical Review (LTR) Task Force, as well as with institutions involved in the Water, Sediment and Biota Quality Component of the project.
- Take consideration of the results of earlier executed training needs assessments on MWW and Water and Sediment Quality Monitoring, as well as the experiences and feedback from earlier training sessions in this regard. The Contractor will consult reports of these assessments, as well as their custodians (UNEP/GPA, UNESCO-IHE, IAEA Monaco and CSIR Durban) in order to obtain inputs for the comprehensive needs assessment under these Terms of references.
- Organize and facilitate a training needs analysis session during the second regional MWW and PADH Task Force meetings scheduled to be held in the Comoros in the period 26-28 October 2005.
- Facilitate and provide inputs for the establishment of a discussion forum on training needs for the WIO-LaB project website.

B. Determine educational needs on LBA in the project countries:

¹ It is noted in this aspect that earlier needs assessments were carried out on MWW (by WIOMSA and UNESCO-IHE on behalf of UNEP/GPA) and Water and Sediment Quality Monitoring (by IAEA in collaboration with the CSIR on behalf of the WIO-LaB PMU). Consequently, additional survey work on these topics will not be required.

The Contractor shall:

- Identify relevant activities on education curriculum development through consultations with the National Educational Institutes.
- In consultation with the National Focal Points, identify priorities and opportunities for supporting educational programmes and activities, including:
 - School activities such as competitions, open days, environmental clubs, visits to MPAs and theme parks, etc.);
 - Support to curriculum development;
 - Development of awareness building materials for schools and learning institutes;
 - Training for school teachers on LBA themes; and
 - Support to MPAs to train professional guides for school programmes.

In doing so, the Contractor shall:

- Interact directly with National Focal Points for the project, National Institutes of Education (Including Teachers Training Colleges) as well as relevant educational institutions and other relevant stakeholders.
- Facilitate and provide inputs for the establishment of a discussion forum on educational needs for the WIO-LaB project website.

C. Develop a Training and Educational Programme for the project:

The Contractor shall:

- Develop a Training and Educational Programme for the project, based upon the findings and priorities set as part of part A and B of this Terms of References. The Programme will include:
 - Training activities related to the effective implementation of project activities;
 - Training activities related to general capacity building in the field of LBA management;
 - Support to educational programmes and school activities (e.g. school competitions, open days)
 - Recommendations for the development of awareness material to be used for educational purposes
- Prepare detailed LBA training curricula using existing capacity and existing courses, where possible.
- Identify and make recommendations with regard to potential educational institutions/organizations in the WIO Region and beyond that could assist in the

development and/or implementation of the various training and educational activities in countries participating in the implementation of the WIO-LaB Project.

In doing so, the Contractor shall:

- In consultation with the WIO-LaB PMU, prepare a draft Training and Educational Programme to be presented for consideration to the Project Steering Committee.
- Finalize the Training and educational Programme on the basis of comments received from the Project Steering Committee;

3. Deliverables

The assignment will result in the following deliverables and their respective timelines:

Deliverable	Timeline
Plan of approach, including questionnaire for assessment, list of stakeholders and means of interaction	15 October 2005
Facilitate a session on training and educational needs during 2 nd MWW and PADH Task Force meetings	26-28 October 2005
Draft Training and Educational Needs Assessment	15 November 2005
Final Training and Educational Needs Assessment	15 December 2005
Draft Training and Educational Programme	31 December 2005
Final Training and Educational Programme	28 February 2006

4. Job requirements:

- Experience in the execution of training needs assessments.
- Good knowledge and understanding of the technical and institutional subject matters involved in LBA management (i.e. MWW management, PADH, Legal aspects, monitoring and assessment);
- Access to a good network of institutions, NGOs and other organisations in the field of LBA and coastal and marine environmental management in the WIO region;
- Capacity to draft Training Programmes and Reports in either English or French;

5. Type of contract:

The assignment will be executed on the basis of a memorandum of Understanding to be established between Contractor and UNOPS. Implementation of the assignment will be spread over the period September 2005 – March 2006.

6. Supervision given to the assignment:

The work of the Contractor will be supervised by the WIO-LaB Project Manager.

ANNEX II

Contributors to the WIO-LaB survey of Education Needs

Kenya

Sarah Ater - PROZIM
Gladys Okemwa - KESCOM
Washington Ayiemba- Nature Kenya
Nyawira Muthiga – Wildlife Conservation Society
Eng. Wainaina – Coast Development Authority
James Kairo – IOI East Africa
Lafarge Ecosystems
Sam Weru – WWF Kiunga
Steve Trott – Watamu Turtle Watch
Benerd Okeyo – Eco-Ethics

Tanzania

Information for Tanzania compiled by: Rose Sallema

Comoros

Information for Comoros compiled by: Fatouma Abdallah Ali

Seychelles

Information for Seychelles compiled by: Kerstin Henri

South Africa

Information for South Africa compiled by: Bernadette Snow and Lucy Scott

ANNEX III

Education questionnaire distributed in some of the WIO countries

You are kindly requested to fill out the questionnaire and return it to juku@kmfri.co.ke (cc julius@wiomsa.org) before **20th December 2005**. Kindly provide your name and contact information. If you are filling the questionnaire as a group, provide the information of the contact person from the group.

<i>Your Name</i>	<i>Organisation</i>	<i>Country</i>

1. Are you or your institution involved in education programmes geared to building awareness in the areas listed below? If yes, elaborate how you are involved in these activities eg. Do you support school activities, competitions, open days, stakeholder awareness seminars, environmental clubs, visits to marine protected areas (MPA's)

Sector	Tick	If yes, elaborate how you are involved in these areas
Tourism		
Aquaculture		
Ports and harbours		
Coastal mining		
Municipal Waste Water Management		
Solid Waste Management		
Agriculture		

2. Where do you get funding for your educational programmes?
3. Do you or your institution support curriculum development in any of the above focus areas?

4. Do you or your institution support the development of awareness building materials for schools and learning institutes? If so, what type of materials and who is your target audience?
5. Do you conduct training for school teachers on municipal waste water discharge, solid waste management, water quality assessment, biodiversity, sediment quality, tourism, port and harbour activities, coastal mining and agriculture, habitat destruction, policy and legislation awareness ? If yes, what elaborate on the type of training conducted? Give details of where and when such training was conducted and the target groups?
6. Inadequate capacity has affected the protection of the marine environment from land based activities. In your opinion which of the areas listed above are priority areas for education purposes? Why?
7. Do you provide support to marine protected areas to train professional guides for school programmes?
8. Do you have any comments or suggestions you would like to add?

ANNEX IV

Education questionnaire distributed in South Africa

PRIORITIES AND OPPORTUNITIES FOR SUPPORTING SCHOOL EDUCATIONAL PROGRAMMES AND ACTIVITIES IN YOUR COUNTRY.

	YES	NO
Grade R – 3 (Foundation phase)		
Grade 4 – 6 (Intermediate phase)		
Grades 7 – 9 (Senior phase)		
Grades 10 -12 (FET)		

1. What school activities could be supported e.g. environmental clubs linked to land based activities.
2. Would you make use of curriculum linked resources on topics relating to land based activities? At which grade would you focus these resources?
3. What learning areas do you think could benefit from information pertaining to land based activities? (*tick next to the learning areas*)

Science	
Technology	
Mathematics	
Social Science	
Arts and culture	
Other (specify)	

Comments:

4. Do you recommend training of educators on resources and land based topics and why?
5. Would you recommend the development of awareness raising materials and where would you focus these and in what form should they be (see list below). Please motivate your selection.

Posters	
Travelling display	
Books/stories	
Flyers	
Fact Sheets	
Media (articles and radio)	
TV Programmes (documentaries and children programmes)	
Other (please state these)	

6. Do you think training support to professional environmental educators and tour operators on land based activities would be beneficial and why?

7. Any other comments under this heading you would suggest?

Thank you for your contribution.
Please return this questionnaire by email to bsnow@telkomsa.net by 15 February 2006.