Rapid Assessment of Perceptions

To inform the Elementary Schools
Environmental Education Initiative in Eritrea
Rapid Assessment of Perceptions

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Executive Summary

Elementary Schools Environmental Education Initiative (ESEE Initiative)

In June 2009, Live & Learn Environmental Education acting as a consultant to UNICEF undertook a Rapid Assessment of Perceptions (RAP) with regard to Elementary School environmental education in Eritrea. The RAP was undertaken at 11 schools in three Zobas (administrative districts) with key stakeholders, including students, teachers, school administrators and PTA members. The RAP approach was designed to develop an understanding of the local conditions and context, particularly with regard to local people’s perceptions of environmental and educational issues. The RAP was undertaken through a variety of participatory, interactive techniques so as to give voice to the various local stakeholders.

Schools are understood in this RAP to include the physical buildings, grounds and resources of the school, the students and teachers, and also the extended network of stakeholders who form the wider school community. Only taken together can these various components of a school create the conditions that enable effective education of students so that they become productive, responsible, and fully participating members of their future communities. Therefore, this RAP attempted to understand schools in a holistic way by incorporating the multiple factors that contribute to schools and their place as part of a community.

The RAP revealed that people’s perceptions of environmental issues were dominated by their interactions with their immediate environment and that the foremost of their concerns related to water availability and quality. The RAP also highlighted the strong relationships which exist in school communities and the close connection that Eritrean people have to their physical environment.

The RAP revealed widespread interest and commitment by all members of the school community to moving forward and improving both education and the school environment when opportunities to do so are created. The RAP also pointed to ways that this project might contribute to the process of improvement by empowering people in the school community with additional knowledge and skills to manage the challenging education and environmental conditions.
A parallel process of curriculum analysis was undertaken in conjunction with the RAP in order to identify how environmental education fits within the existing curriculum content. The findings from that analysis are included in this report. The analysis process involved a detailed mapping of the curriculum to establish where and how environmental education is being taught. The information was recorded in the form of a matrix showing subject, educational level, topic, and key content, and showing where environmental links exist or can be made.

The curriculum analysis showed that environmental education is happening across the elementary school curriculum but especially in Science and Social Studies. The emphasis in the curriculum is on learning ‘about’ the environment rather than ‘in’ or ‘for’ the environment. International understanding suggests that environmental education is most effective when children can support their learning about the environment by experiencing the environment directly, and by working actively to protect and preserve the environment.

Findings and Recommendations

There were 12 key findings, which developed from the RAP process and curriculum analysis

- The environmental issues of most concern to all school stakeholders were those that impacted most closely on their daily lives; Water, Sanitation, Plants

- Water and financial restraints create perceptions that further environmental projects and learning activities are not possible, or extremely limited in the schools

- Plants and in particular trees and crop plants are the main way that people interpret their active involvement with the environment.

- The new ‘National Curriculum Framework’ is transformative and is having a significant influence on the teaching and learning in classrooms

- Teachers generally teach one or maybe two subjects only and follow textbooks and teacher guidelines closely. They would need support to engage with environmental education material that extended their knowledge base beyond their normal classroom practice.

- Interactive and learner-centred pedagogies are understood and supported by the teachers, but they need further support to operationalise these approaches and to incorporate them into their routine practice.

- Teachers value teaching aids and practical activities but need many more resources to teach inclusive Environmental Education

- Clubs are present in most schools and many have a version of a ‘Green Club’. Most of these Clubs are limited to planting and watering trees.

- There are very strong supportive relationships between the schools and their PTAs and involvement of the whole school community through the PTA will strengthen environmental education

- Other Ministries, Departments, and their partner organisations are producing environment related messages and/or resources that are being distributed to schools and communities

- Environmental education is being taught across the curriculum but particularly in Social Studies and Science. However, the focus of the curriculum is on learning ‘about’ the environment rather then ‘in’ or ‘for’ the environment.

- There is some cross curricular work however it could be extended and strengthened
From these findings the following general recommendations were developed to inform the next writing phase of the project:

- Materials produced should be aligned to, and extend, the existing curriculum content as represented by the Expected Learning Outcomes, textbooks and Teacher Guides of core subjects. They should do this by means of:
  - Using learner-centred interactive pedagogy
  - Being organised by subject and Grade level
  - Constructing, where possible, themes that link in a cross-curricular way and provide iterative spiral connections through successive Grades.
  - Being strongly activity based
  - Creating opportunities for authentic learning experiences
  - Providing an easily usable ‘Curriculum Companion’ for teachers, which guides them through activities they can use to deliver the environmental content of their lessons better
  - Providing additional resources that extend teaching possibilities

- Materials produced should be coordinated to encourage a holistic whole school approach to Environmental Education by supporting extra-curricular activity and community engagement as well as classroom practices.

- Extra-Curricular Clubs can be strengthened by provision of separate material and be used as entry points for wider community engagement

- To facilitate community engagement, a ‘Community Handbook’ could be compiled and distributed through the PTAs

- Messages and activities included in the material should be aligned to and supplement rather than replace existing messages carried to schools and the wider community by other Ministries and their partner organisations.

- The reality of water shortage and financial constraints must underpin considerations of appropriate material and activities. Activities must draw on up to date science related to dry land agriculture and sanitation, and should use appropriate low cost technology.
The Eritrean Context

Eritrea is in the North-East of the African continent, bordering the Red Sea. The country has a land area of 124,320 square kilometres and a coastline that stretches for a 1000km. Eritrea is one of the most recently independent nations of the world, having declared independence on May 24th 1993. Although the modern country of Eritrea has a relatively short history, the people of Eritrea have a very long history of association with the area. Throughout that history, the complex and intricate interaction between the people and their physical environment has underpinned the development and well-being of the country. Through largely subsistence agriculture and animal herding, land remains the basic source of livelihood for approximately 80% of people.

The people of Eritrea are of nine different ethnic groups spread geographically through areas that range from coastal marine ecosystems to highland agricultural environments and areas of established and encroaching desert. Climate, and particularly rainfall, plays a major part in the distribution and activity of the people of Eritrea. The entire land area is arid or semi-arid with unreliable or insufficient rainfall. In 2008, there were not good rains and the drought conditions further highlighted the sensitivity of the environment and the consequent vulnerability of Eritrean people to changing climatic conditions. Drought conditions exacerbate existing environmental concerns such as deforestation, erosion and desertification, and make the provision of adequate sanitation challenging. Drought is by far the most threatening and most likely of natural disaster events.

The government of Eritrea has set the combating of desertification and the sustaining of agricultural productivity as a high priority. Many projects have been implemented by various Ministries within the government towards these ends. This report represents the first phase of one such project. It represents an effort, through a partnership between the Ministry of Education in Eritrea and UNICEF, to support and increase effectiveness of Environmental Education at Elementary school level.

Drought conditions exacerbate existing environmental concerns such as deforestation, erosion and desertification, and make the provision of adequate sanitation challenging.
Environmental Context

Eritrea has three distinct geographic zones which by their nature influence climatic patterns. Including the transition zones between geographic areas there are six identifiable climatic zones. All areas of Eritrea are arid or semi-arid with insufficient or unreliable rainfall. The natural aridity of the country, and intermittent more severe drought conditions, combined with the inevitable impacts of people and the effects of 30 years of struggle prior to the liberation of the country has resulted in some environments that have been degraded. Erosion and loss of soil fertility have compromised the livelihoods of the 80% of the population that rely on a land-based means of existence. Similarly, deforestation caused by climate changes and the demand for firewood has seen the natural forest cover drop from about 30% just over 100 years ago to about 1% now.

The Eritrean government has prioritised projects that mitigate or reverse the degradation of arable land. Several Ministries are involved in infrastructure and development projects that are directly related to environmental well-being. Such projects include water infrastructure systems and an extensive tree planting program. Since 1992 the government has built over 252 dams and 7000 wells as well as terracing 32,000 acres and planting 80 million trees (Eritrea Profile, 2009).
Education in Eritrea is mandated at a National level and is delivered through six Administrative Zones (Zobas); Maekel, Southern Red Sea, Northern Red Sea, Gash-Barka, Debub and Anseba. Schools are organized into three levels; Elementary schools, which cover grades 1-5; Middle Schools catering for grades 6-8 and High Schools which take students through to grade 11. Following graduation from grade 11, students travel to a national centre and undergo an additional year of training which includes further education and military training. This final year of education determines how the young people will be deployed for the following period of National Service.

This project is targeted specifically at Elementary level, which covers Grades 1-5. At Elementary level, instruction is in the local language. There are nine major ethnic groups in Eritrea, each with their own language, and as a result educational resources and texts are produced for Elementary Schools in: Tigrinya, Tigre, Bilen, Saho, Afar, Hidareb, Nara, Kunama and Arabic.

There are approximately 760 Elementary Schools throughout the country with around 8,000 teachers. These schools and teachers provide education for approximately 378,000 students. (Eritrea Basic Education Statistics 2004/05). Schools operate on a day to day basis under the guidance of a Director. The Director also works closely with a PTA at strategic and practical levels on issues related to school maintenance and finances as well as issues concerned with student and staff welfare. Class sizes average around 50 students, and most schools operate in two shifts with morning and afternoon sessions. Timetables are organised along discipline lines and teachers tend to teach 1 or 2 subjects only, across several grade levels.

Education is seen as an important piece of the mixture of measures that can help to build resilience and sustainability in a marginal environment.
One of the many challenges that confront governments of newly constituted independent countries is the redesigning and implementing of an education system that meets the needs of its people. In the few short years since independence, the Ministry of Education in Eritrea has moved a long way towards its goal of providing an appropriate and effective education system for all Eritreans. The introduction in 2008 of *The National Curriculum Framework for Eritrea* establishes a comprehensive and coherent basis for structuring the education system. The document sets out curriculum policies and principles, and incorporates guidelines as to how these are to be implemented in practice.

Accompanying the roll out of the new curriculum has been a program of rewriting and trialling textbooks and teacher guides that reflect the changed emphasis and new pedagogical approaches. Currently this process is nearing completion with the early grades completed and grades 4 and 5 in the latter stages of trialling. There has also been ongoing teacher professional development to provide skills and methods for the new learner-centred pedagogical approaches favoured in the ‘Framework’. Environmental Education is specifically mentioned in the *The National Curriculum Framework for Eritrea* and is introduced as being a theme for which a cross-curricular approach is appropriate.

**The Elementary Schools Environmental Education Initiative (ESEE Initiative)**

**ESEE Initiative Goal**

The Goal of the ESEE initiative is to ensure that Eritrean Elementary School students have equitable access to effective Environmental Education that addresses relevant environmental, health and hygiene issues. This fully aligns with the ESDP, Eritrea’s national development strategy for the education sector as well as UNDAF and UNICEF programme outcomes.
ESEE Initiative Objectives

The ESEE initiative has three specific objectives.

1. **To improve knowledge, attitude and skills of elementary school children to address eco-friendly, healthy and good hygiene behaviour ensuring that beneficiaries demonstrate capacity to prepare for and manage natural disasters.**

To meet this objective, the initiative will support development of quality teaching and learning materials and tools for formal education. The focus in this regard is to enable students’ improved level of knowledge with emphasis on their practical application of knowledge to daily activities. In particular, it embraces the wider school curriculum by supporting the existing school health and hygiene clubs, and environmental related clubs to promote learning experiences.

2. **To train teachers so that they acquire and apply child-centered inquiry learning approaches to improve the quality of teaching and thereby also contribute to increasing retention in schools.**

Teachers will be provided with skills to apply inquiry learning approaches when teaching environmental studies using Eritrean developed materials and tools. Encouraging an attractive learning environment will contribute to improving enrolment and retention, which means that children continue learning in a protective environment.

3. **To strengthen capacity of PTA and community members to play key roles in preparing for and managing natural disasters.**

In particular PTA and communities will be encouraged to participate in gardening practices together with students, which could mitigate the effects of food price increase.
Scope of Implementation and Activity Areas

The ESEE initiative will be implemented across Eritrea in the following six Administrative Zones (Zobas); Maekel, Southern Red Sea, Northern Red Sea, Gash-Barka, Debub and Anseba.

To achieve the overall Goal and Objectives a series of activities will be undertaken, including:

1. Development of educational materials:

   To develop “Best Practice Guidelines for Teaching Environmental Studies in Eritrean Primary Schools” covering the following content;

   ✔ Human Health and Environmental Issues;
   a. Environmental Health
   b. Human Settlements
   c. Climate change
   d. Coastal and Marine Pollution
   e. Industry and the Environment
   f. Waste Management
   g. Gardening and compost management

   ✔ Natural Resources and Management Issues
   a. Water Resources
   b. Land and Soils
   c. Forest Resources
   d. Natural Heritage and Biological Diversity
   e. Coastal and Marine Resources
   f. Energy Resources
   g. Mining and Mineral Resources

   ✔ Environmental Security
   a. Landmines, Unexploded Ordinances (UXOs)

2. Promotion of practical skills

   a. To develop a practical tool box for environmental studies activities such as on weather, water, waste, energy, environment and biodiversity.
   b. To strengthen the School Health and Hygiene Clubs to promote healthy and good hygiene activities.

   In particular, to support the clubs in Child Friendly Schools to promote school gardening practice in which students apply the knowledge on environment (e.g. weather, soil) and human health (nutrition).

3. Teacher training

   The ESEE initiative will provide teachers (both trained and untrained) with the skills to be able to use learner-centred pedagogy through inquiry learning approaches when teaching Environmental Studies.
ESEE Initiative Structure

The ESEE initiative will be undertaken during 2009/10 in four distinct phases. The initiative started on the ground in Eritrea in June with the Rapid Assessment of Perceptions (RAP), which is the focus of this report. The stages of the initiative are:

1. **Rapid Assessment of Perceptions (RAP)**. The RAP will be described in detail in the next chapter, but in essence it is a process designed to assess particular Environmental Education perceptions of selected participants in Eritrea. The information gathered in the RAP will enable the producers of the educational material to more closely align it to the specific situation and conditions in Eritrea.

2. **Design and Development of Educational Materials**: A team of professional writers working both in Eritrea and in Australia will put together materials that are designed to meet the Environmental Education objectives outlined earlier.

3. **Testing and Rewriting**: The pilot materials produced in the previous stage will be trialed with teachers and students in Eritrea and modified as necessary to enhance their effectiveness.

4. **Teacher Training**: A program will be undertaken to train Eritrean teachers in the use of the new materials.
Effective Environmental Education

The ESEE Initiative is informed by the view that it is important for the design of environmental education in Eritrea to be informed by international best practice. Environmental education has evolved from being a response to the environmental crisis coming from increased contamination of land, air and water, growth of the world’s population and the continuing depletion of natural resources. There is now a much stronger emphasis on integrating thinking and action around ecological, social, political and economic systems. It has become critical to acknowledge the complex relationships between these four systems if we are to achieve a sustainable future.

The United Nations Decade of Education for a Sustainable Future began in 2005 (2005-2015). Fundamental to the framing of this initiative is that a sustainable future requires transformational change of values and behaviour at all levels from the individual to the global.

Whole school Approach

Effective Environmental Education includes curriculum but also requires the involvement of the whole school. Successful Environmental Education influences all aspects of school operations, curriculum, teaching and learning, physical surroundings and relationships with the local community.

Whole School involvement
A school with effective environmental education practice has a vision and goals for the contribution it can make to environmental education which encompasses:

- Inclusion in the curriculum and the teaching and learning; skills, values and actions that support sustainability of people and natural resources.
- School organisation and operation
- School design
- Development and management of school grounds
- Maximisation of the harvesting of water and management of the use of precious resources such as water, energy, wood as well as management of waste.
- Enhancement of connection with the broader school community and other education institutions
- Conservation and protection of heritage values in the school and its grounds.

Organisational framework for Environmental Education

Environmental education is not only what we learn but how we learn, and how we know it is learnt. A popular framework for organising learning experiences in environmental education is ‘about, in and for the environment’.

- Education about the Environment refers to the important understandings of facts, concepts and theories developed in students.
- Education in the Environment refers to students’ direct contact with the natural environment such as a beach, a mangrove, a forest, grassland, or the school yard as a way to develop an awareness and concern for the environment.
- Education for the Environment aims to motivate lifestyles in people that are compatible with the wise use of environmental resources.

Methodology and outcomes

Consistent with ‘The National Curriculum Framework for Eritrea’ (see chapter 3) effective environmental education practise requires learner-centred, interactive teaching and learning. This methodology is a powerful way for students to develop the knowledge, understandings, skills, capabilities, attitudes, values, action and participation that is necessary to sustain life. Critical thinking and learning how to work collaboratively to improve human and environmental well-being are also important outcomes for environmental education.

In the same way that the Life Skills program in Eritrea, develops skills, clarifies values and instils behaviour change where behaviours might be detrimental to the well-being of the individual, environmental education follows a similar process to reduce human impact on the natural environment.
Aim of the RAP

The Rapid Assessment of Perceptions was designed to identify key stakeholders’ perceptions of environmental issues, and to provide an analysis of the main factors and variables within the elementary school system that contribute to ways of implementing effective, action-based environmental education.

The RAP is a qualitative social research instrument and its findings are grounded in the actual communications of the stakeholders who participated in the process. The RAP involved a facilitated process of consultation aimed at capturing as authentically as possible the local perceptions, attitudes and behaviours connected to both education and the environment. As a qualitative study, it is not presented as a technical report or as a statistically significant quantitative interpretation of Elementary Schools in Eritrea. The RAP will be used to inform the content, methodology, delivery techniques, evaluation, replication and sustainability of the ESEE Initiative and most importantly ensure these are consistent with the Eritrea context and education culture.

RAP Objectives

In line with the ESSE Initiative the specific objectives of the RAP are:

1. To ascertain the extent of teachers’ understanding of environmental education and what they perceive environmental education can do.
2. To identify curriculum links, strengths and opportunities for the mainstreaming of Environmental Education;
3. To inform the writing and content of education and learning resources;
4. To inform ESEE Initiative Monitoring and Evaluation

Education is seen as an important piece of the mixture of measures that can help to build resilience and sustainability in a marginal environment.
Key Research Questions

The use of research questions in a RAP is to ensure the collection of appropriate information for the ESEE initiative; the approach discourages the collection of extraneous information and so maximizes the time set aside for research. Key research questions include:

1. How do teachers perceive elementary environmental education?
   a. What are the current environmental education practices?
   b. What are the perceived environmental problems on which environmental education could have the greatest impact?
   c. What challenges and opportunities lie ahead to address these issues?
   d. What does a successful environmental project look like?

2. What are the students’ perceptions of the environment?
   a. What do the students know about the environment?
   b. How do they know what they know?

3. What are the current curriculum links?
   a. What are the linkages?
   b. Who reviews the curriculum and how often?
   c. How are needs and community aspirations reflected in the curriculum?
   d. What training opportunities are available for curriculum writers?

4. How can the ESEE initiative be linked with PTA and communities?
   a. Identify entry points within the community and PTA for the ESEE initiative
   b. Identify entry issues
   c. Identify how the ESEE initiative and schools in general can be used as catalysts for change at community level
Background to RAP approaches

A prevalent perception of research is that it needs to take place over an extended period of time to generate valid data. This can be problematic when research is needed to inform program design in a short period of time. As a consequence, researchers from Live & Learn Environmental Education have developed rapid research procedures and techniques for use in different cultural and geographic settings.

The research procedures developed form the basis of the RAP that is presented here. Essentially a RAP can be characterized as

“A semi-structured process of learning with and from people about their perceptions of such relevant factors as: strengths, needs, problems, conditions, local resources, expertise, capabilities, experience and social context.”

The advantage of the RAP is the establishment of a project starting point which is grounded in the best possible interpretation of ‘where people are currently at’. In this way, RAPs emphasize the collection of community-based information; they examine the perceived relevance of a range of social, cultural, economic and environmental factors that might influence an issue. It is implicit in the RAP approach that perceptions underpin action and behaviour and that understanding perceptions is important if educational interventions are to bring about behaviour change. It is commonly accepted by academics and environmental educators that environmental education only becomes fully effective when it results in actual changed behaviours.

A key philosophy behind the RAP research approach emphasizes the participatory nature of the research and that the research should represent a partnership between researchers and stakeholders. This philosophy has resonance with other established research methods including for example: Participatory Learning Methods (PLM), Participatory Action Research (PAR), and Participatory Learning in Action (PLA). Genuine collaboration of stakeholders with the researchers can facilitate the production and flow of knowledge and shape Programs such as the ESEE Initiative.

In the case of this RAP strong three way partnerships were constructed consisting of; The Ministry of Education, the school community stakeholders and a team of researchers/environmental education experts from Live & Learn acting as consultants to UNICEF. The Ministry was an essential partner in the RAP processes of initiating and collecting the data, and they will be an equally critical element when it comes to refining the use of the data during trialing of resources and ultimately in the effective dissemination and use of the finished materials.

RAPs use qualitative research methods to facilitate the exploration of relationships, interactions and perceptions. They are not technical investigations and use quantitative data only in support of, and incidental to, the primary aim
of capturing the qualitative perceptions of the participants. Findings derived from RAPs are therefore very much grounded in the understandings and interpretations of the specific participants in the process. It is important to acknowledge however, that the researchers are not present as objective observers but participate as partners in the active construction of dialogue and discussion. It is inevitable that the data also reflects the researchers part in the process, but once again it must be stated that objectivity is not the aim of the RAP process.

Common methods involved in carrying out and documenting RAPs include such techniques as: Interviews, ranking, mapping, focus groups and observations. However, an essential feature of a RAP is the tailoring of specific methods to meet research objectives; so the choice of methods suggested are determined by the key research questions put forward. The actual methodologies utilized and the rationale for their selection will be covered in the next section of this report.

Scope of the RAP

The initial intention of the RAP was that it would cover groups of 4 teachers and 4 students from each of 4 schools in Asmara, the capital city of Eritrea. Where possible, members of the wider school community for example PTA members would also be included. Such a sample of schools and their stakeholders represents the minimum requirement that would enable the ESEE initiative to gather the data necessary to proceed in an informed way, but the information gathered would necessarily be limited.
The research team was keen to extend the scope of the RAP to include schools outside of Asmara that might be experiencing environmental issues in different ways. Fortunately, with the support and active effort of the Ministry of Education in Eritrea the team was able to extend the scope of the RAP. The RAP was eventually able to encompass 11 schools in three different Zobas; Zoba Maekel, Zoba Ansebar, and Zoba North Red Sea. The schools were selected by the Ministry of Education at the Zoba level and included large and small schools, and schools in both the city and country. The level of water scarcity in schools ranged from extreme to moderate. The resultant coverage of the RAP not only included more schools and a wider range of contexts but also covered a more inclusive group of stakeholders including teachers, students, school directors, administrators, supervisors and PTA members. As a result the data gathered was richer and more holistically representative of the school community than had initially seemed possible within the time constraints of the project.

The Ministry of Education was the critical partner in facilitating access to schools, and their stakeholders, including several schools which had already finished the term and had closed. The Ministry also supported the project by providing excellent people to accompany the team and who were able, where necessary, to translate. As a result of their active involvement in the RAP process, these Ministry representatives represented further education stakeholders whose perspectives were able to contribute to the findings that emerged from the RAP.

Implementation of the RAP

RAPs are not prescriptive as to methodology. By their nature, they need to be responsive to the particular context of the communities from which information is sought and the particular ways of engaging those communities in the information gathering process. The RAP process was (with two exceptions) undertaken during school hours with the school operating. The processes employed were therefore modified to minimize disruption to the schools’ normal operations.

This RAP employed highly participatory methods that primarily involved facilitated discussions with selected groups of stakeholders. The discussions were semi-structured in that they were constructed around key themes with only a few focus questions. This method of structuring the interviews/discussions is based around principles of ‘Active Interviewing’ which recognizes the situated nature of interviews within the participants’ different backgrounds, experiences and worldviews. Interviews of this type don’t seek uniformity and objective answers to standard questions, but rather create a process whereby conversations develop organically, and meaning is negotiated and co-constructed throughout the process. Such interviews allow for deviation into areas of interest not previously considered and create opportunities for a richer engagement than more structured processes.
The RAP generally started in each school with the Director and other interested non-teaching stakeholders. These other stakeholders included combinations of assistant directors, supervisors, administrators and PTA members. For logistical reasons and because many of the PTA members had given up time from other jobs to be present, these stakeholders were engaged in the RAP process together. The result was a rich process with diverse contributions and at times animated discussion.

The interviews with the teachers and students were generally able to be conducted separately. The teacher groups were varied both in numbers and composition depending who was available at the particular time. In some cases teachers were released from class, in other cases only the teachers with non-contact periods were able to participate. In several schools the groups changed and evolved as different teachers came and went and particular teachers were brought in to contribute in their specialist areas. In one of the closed schools, only one teacher living in the village was available but generally the team was able to talk with more than the four teachers that the original RAP design suggested.

The interviews with the students were generally with grade 4s and 5s and the students were taken from class. The students were additionally prompted and engaged by the visual stimuli of pictures (coloured photographs), which illustrated various themes of environmental interest. The students were encouraged to share stories and knowledge about the pictures and were asked to elaborate on the source of their knowledge and the reasons why learning about these things was important.

The visits to the schools also included extended walks around the school guided by the Director and PTA members. These tours allowed for a lot of informal questioning by various team members and the opportunity to make detailed observations. These ‘walks around’ invariably also created opportunities to interact informally with students.

**Triangulation and validity**

Triangulation is characteristic of RAPs in general and allows for increased validity of the data. This is particularly important when the number of participants is small. Triangulation with this RAP consisted of examining for consistency the responses of the different groups interviewed separately. Further evidence for cross-checking responses was obtained by observation during the ‘walks around’. Additional confirmation of some aspects of the information obtained was made possible by subsequent conversation with knowledgeable people outside of the RAP process, in particular people within the Ministry of Education were able to contribute to understanding of educational matters and members of groups like EDA (Eritrean Demining Authority) were able to contribute to understanding of specific environmental issues. It is suggested here that the findings presented have a high degree of validity.
The RAP and ESEE Initiative Monitoring and Evaluation

The RAP findings can be used to supplement objective information with subjective insights. They describe the context in which the ESEE Initiative will be implemented. The RAP findings can therefore be used as baseline data for future monitoring and evaluation. The RAP design allows the consequent ESEE Initiative to measure impact against the three above-mentioned objectives by revisiting schools and assessing progress. This is envisaged to benefit UNICEF’s and the Ministry of Education’s longer term planning and strategies on environmental education in Eritrea.

Limitations of the RAP process

Inherent within the RAP design is that it attempted to build a story of the perceptions of a nation of diverse people and diverse environments from a small sample of schools and relatively brief encounters. While the process can be justified both theoretically and in terms of time constraints, it is acknowledged here that certain viewpoints and situations may not have been heard during the RAP process. It is further acknowledged that some of what was heard may have lost emphasis or subtlety through the necessary requirement of people speaking through translators or using a second language.

Finally, the issue of bias arises when it comes to interpreting and analysing the data gathered. It is recognised here that the researchers were deeply and deliberately embedded in the data collection process. Indeed, there was no attempt at objectivity and the researchers were an active part of co-constructing meaning in the RAP. Although deliberate bias was not intended, it is acknowledged that different researchers would have constructed interviews differently and may have obtained slightly different outcomes. Nevertheless, the use of triangulation as described above and the composition of the research team with their diverse backgrounds minimises the likelihood of systematic bias.
Introduction

The RAP was undertaken with a range of people in places that varied considerably with regard to their geographic locations, their available resources and the nature of their contributing communities. Nevertheless, despite the inherent diversity in each RAP process, several consistent themes and ideas emerged. These themes, although not unanimous, were recurrent enough that they seemed to represent a broad consensus and are represented as the ‘Key Findings’ at the end of this Chapter of this report. It needs to be noted however, that while this type of report is necessarily reductive and focused on commonalities, the combined experience of visiting all the schools created an impression of rich and vibrant diversity underpinning the fundamental strength of Eritrean people and communities.

In recognizing the diversity within and between the contributing communities, it is also necessary to make clear that schools are themselves complex. Schools are understood in this RAP to include; the physical classrooms and compound, the staff and students, and to also encompass the vested interests of the wider community. Using this interpretation, schools involve complex interactions and relationships between the multiple stakeholders. This RAP was undertaken within this holistic and inclusive understanding of schools and the findings of this RAP reflect this view. Attempts are made in these findings to consider all the multiple viewpoints expressed by participants, and to specifically orient key findings towards possibilities for building on observed strengths. It is proposed here that building on existing strengths is the best way that schools can be encouraged to practice effective environmental education that extends beyond classroom and school boundaries.

The findings presented here are organized into three parts, which relate to the objectives and research questions of the RAP as described in the previous chapter. Part One relates the findings that derived from visits to school communities and the RAP processes undertaken with the school stakeholders. The first section of this Part describes the participants’ perceptions and interpretations of the environmental issues that confront the school, the wider community, and Eritrea as a nation. This section

Findings

Part 1: School Communities

It is proposed here that building on existing strengths is the best way that schools can be encouraged to practice effective environmental education that extends beyond classroom and school boundaries.
aggregates the perceptions gathered so that they represent the whole community of stakeholders. The next section examines the education context, and specifically the current practice of environmental education as described by the participants. The following section focuses on findings with regard to the links between the school and the wider community.

Part Two relates the findings with regard to the Curriculum, which derived from the parallel RAP process of discussions with the ESEE Initiative partners in the Ministry of Education. Part Two concludes with findings that were gathered outside of direct RAP process of participatory dialogue, but which can enrich understanding of the ways forward.

Part Three presents the Key Findings that have arisen from the RAP processes and gives specific recommendations with regard to each of these findings.

Participants’ Perceptions of Environmental Issues

Introduction
This summary of participants’ perceptions with regard to environmental issues is aggregated and is inclusive of all the stakeholders who participated. Although the data was collected separately from the different stakeholder groups during each school visit, the process of data analysis and triangulation indicated that there were significant similarities between the different groups’ perceptions. The PTA representatives were perhaps taking a wider view of issues, the students presented a less complex view reflecting their more limited experience, and the teachers were more focused on educational aspects of wider issues. Essentially however, all stakeholders understood the immediate issues confronting the school and its community in the same ways. Combining their responses creates a more complete picture, which reflects the complex reality of the functioning schools.

The major issues highlighted here are examined separately, but they are all interlinked and were understood to be connected parts of the whole environment by the people involved. The connections were explicitly made in different ways and these are brought together in the last segment of this section to describe an environment with an intricately linked web of issues and concerns.
Water

“Water” was the instant reaction of all the participants when asked about significant environmental issues. In only two of the schools did people not consider that water was an immediate problem for the school itself, and in one of those schools water was nevertheless strongly represented as being the major concern of the wider school community.

Water scarcity dominated the early discussions about the school environment and was seen to be the main limiting factor in what it was possible to achieve with regard to the physical school environment. Several schools had no water at all and relied on students to bring water from home if any were needed, including for the watering of trees. Other schools relied on buying water and were limited financially to minimum amounts. Many of the schools had partial or planned water harvesting projects, but these projects were either incomplete or insufficient to alleviate the severe water shortage. There were no examples of interim or small scale water harvesting in barrels, although the guttering and downpipes were often in place to allow such measures. While insufficient to relieve the school-wide need for water, such small scale collection efforts might provide for sufficient water to enable small scale learning opportunities. Water is clearly a constraint on what environmental projects are possible, but with that said; it need not stop well designed activities that can work within the water limitations.

Water quality was also of concern to some of the communities represented, particularly in Zoba North Red Sea where salt levels had risen and compromised the water quality for both human consumption and food production. Water quality was also implicated in a few instances as contributing to health issues, particularly eye problems. Water was connected to other environmental concerns, particularly health and sanitation issues, and plant related issues including food security and replanting efforts to combat deforestation and desertification. Participants talked a lot about the expected start of the rainy season (imminent at the time of the RAP) and the inadequacy of last year’s rains. Drought was seen as the most likely and most damaging of likely disaster events to occur in Eritrea. People felt that they were individually, and collectively within their local community, powerless against the threat and power of drought.

Concern about water in schools was centered mainly on immediate use for students and on related sanitation implications. In the wider community, although scarcity for personal use was an issue it was at least possible to buy water for immediate needs, and the deeper concerns were related to food security and livelihoods.

In most cases water issues including its use, safety and conservation were identified by participants as being important for students to learn at school.
Sanitation

Sanitation was generally the second issue to be raised in the school communities. Several schools related inadequate numbers of toilets as a problem and others with sufficient toilets had them locked because there was no water to clean them. Most of the schools with toilets didn’t have water available for hand washing. In many of the wider school communities sanitation was also identified as a problem with many houses not having toilets. It appeared during discussions with the students that most understood about the importance of sanitation and of hand washing, and the dangers of dirty water. Some talked knowledgeably about germs and microbes, and were able to describe strategies for cleaning dirty water including filtering and boiling water. However, at most schools it was not possible for students to actually wash their hands.

Plants

Plants were the main way that people identified with, and connected to the environment. Plants were by far the most commonly mentioned environment related topic that the adult participants mentioned PTA members specifically mentioned that plants are important for their children to learn about. When students were asked what they thought ‘the environment’ meant, they most commonly referred to plants. Plants were also the most frequently mentioned topic of lessons that teachers gave when asked for examples of their teaching with regard to the environment. Plants were universally considered to be important to the schools, the wider school community and Eritrea.

In the context of the schools’ environment, plants and planting were most commonly synonymous with trees. The majority of schools was involved in tree planting programs and had committed resources and sustained effort towards establishing and maintaining their trees. The nationally organized Summer Campaign uses secondary students to plant trees supplied by the Ministry of Agriculture and this effort is supported by many schools with an additional commitment of time, labour and money. Most schools had some well established trees and some success with new plantings, and the trees were visibly valued and a source of pride. In a few schools each student, or a group of students had their ‘own’ tree and took responsibility for looking after it and bringing water for it.

It was evident however, that many trees had died, and once again a lack of water was cited as the main reason, although soil problems and planting techniques were also blamed. A few schools also had other plants, small gardens or plants in plastic bottles, but none of the schools were actively creating learning opportunities around growing plants. Edible gardens were seen as desirable but were also generally considered an
impossibility in the context of the prevailing water scarcity. In this context, there appears to be many ways that the type of environmental education advocated by this project could enhance current efforts. Such education could also support school stakeholders to acquire new knowledge and skills that would make possible some of these learning opportunities even considering the water restraints.

Three main issues arose with regard to plants and the wider community; deforestation, desertification and food security. Deforestation was the most commonly mentioned, and was a real source of concern for many of the participants. The only reason identified was cutting of trees for charcoal and firewood, and although ideas for mitigating the problem like efficient stoves were mentioned, no comprehensive answers to the problem of firewood demand could be envisaged. Replanting so that cutting was sustainable was the only option advanced.

**PTA member: “All Eritreans know that you can’t cut unless you plant”**

Desertification was primarily seen as linked to deforestation and a consequence of ‘cutting’. Although there was some understanding of wider global conditions that exacerbate desertification, the problem was still seen in terms of not enough trees. As one student put it:

**Student: “Trees stop global warming”**

The third element of concern was food security. The issue of food security was of immediate and pressing concern to the community participants of rural schools whose livelihoods and the well-being of the whole community were intimately linked to agriculture. The issue was also raised and understood by participants in city schools.
Although food security was most closely linked to drought, discussion was framed through the impact of drought on people’s ability to cultivate plants. Students shown stimulus photos of healthy and drought affected maize were generally able to link the difference in the plants to water. Although students had general knowledge through science lessons of factors influencing plant growth and the parts of plants, they were unable to recognize and name many plants beyond common field crops.

Other Environmental Perceptions

Although discussion of environmental issues was overwhelmingly concerned with the interrelated issues of water, sanitation and plants, other environmental issues were mentioned by various people. The other issues raised included; health; soil and water conservation; pollution; fencing of school compounds; and urbanization. None of these issues generated the intensity of the other discussions. Nor were they widely addressed with the next most commonly raised issues being conservation, and pollution, which were raised in three of the 11 communities.

Issues notable by their absence

Some issues were noticeable by their absence. Issues included in the ESEE Initiative list of target topics for materials to address (see Introduction chapter) that were notably absent from the conversations were:

- Biodiversity
- Animals – Although the students were very interested in animals they appeared to consider them as incidental to, rather than integral to the environment. The students knowledge of different animals was generally limited and they were unable to differentiate between animals that were indigenous to Eritrea and others.
- Environmental security – particularly mines.
- Energy – although energy was implicitly involved in discussions of cutting trees for firewood
- Coastal environments
Summary of Perceptions

The RAP participants’ perceptions of environmental issues were very much anchored in the environmental reality of their immediate environment. As such, water, sanitation and plants represented their most significant concerns because these issues impact daily on the community’s well-being. Other issues like pollution and waste were mentioned only incidentally, and several common environmental education themes like biodiversity were not raised at all. Teachers had some knowledge of these other issues, but only talked of them as textbook inclusions and isolated topics rather than as integrated parts of a holistically considered environment.

The overall impression was that the participants were part of an integrated community whose daily lives reflected real environmental stress. In saying that, there was no suggestion from any of the participants that other less personally relevant environmental issues were not important topics for inclusion in school lessons. Nevertheless, it is clear that there are numerous opportunities to create relevant and authentic Environmental Education learning experiences within the school compound and the local communities.

Educational Context: Teaching and Learning

Background

The 11 school communities, which participated in the RAP, were located in three different Zobas (Maekel, North Red Sea, and Ansebar) and ranged in size from 183 students to over 1700. In keeping with the size of the schools, the teaching staff ranged from 6 teachers to 50 (see graph below).
The larger schools operate in two shifts with a morning and afternoon session. Teachers typically have classes for part of both shifts. Students only attend academic lessons in one of the shifts but may attend extra-curricular Clubs during the opposite shift up to two or three times a week. Lessons are 40 minutes and the early Grades have 6 lessons a day, with Grades 4 and 5 having 7 lessons day. Core Learning Areas include: Mother Tongue, English, Science, Social Studies and Mathematics, Arts, and Physical Education. Teachers typically teach only one or two subjects to two or three different Grades, and school departments are organized primarily by subject. Teaching in Elementary Schools is in the local language, and this is universally considered to be important.

Two of the schools were unfenced, and one described a lack of classrooms sufficient to accommodate the number of students. All of the schools had very limited teaching aids (mainly charts designed for teacher transmission modes of teaching), and those schools that had libraries were in a building up phase and had few books. Classrooms tended to be bare with very few things on the walls and no obvious displays or celebrations of student work.

Absenteeism and dropout rates were a concern in only one of the Elementary schools visited. Absenteeism that did occur was for a variety of reasons but was described as relatively low and within acceptable boundaries. Disengagement with school was not identified by any of the schools as contributing to absenteeism. Dropout rates were generally low and attributed primarily to families relocating to other areas. One school described an ongoing situation related to seasonal migration to highlands that meant that students missed parts of the year and had to repeat Grades several times.

Teachers and Environmental Teaching

Teachers from all the Core Learning Areas were represented during the RAP process. A common theme across the discipline areas was that the teachers structured what they did in class to closely follow the textbooks for the particular grade and subject. The teachers found the teacher guides provided valuable assistance in implementing lessons. Teachers made some extra teaching aids themselves, but all expressed the need for more real objects so that there was not so heavy a reliance on pictures. Real objects allow for more creative learning experiences and enable students to investigate for themselves.

The textbooks of all subject areas have topics that include environmental themes and so teachers were often able to connect their subject in some way to environment related issues. As a general rule though, teachers considered that Environmental Education was either a Geography or Science topic. Teachers in other areas described the environmental topics in their textbooks as background context for discussion towards other learning objectives rather than the focus of the lesson.

English teacher: “The environment was the background to create discussion it was not deep investigation”
Science and Geography teachers were able to describe environmental lessons that covered various themes for example plant growth, and climate, and these were all relayed as represented in the textbooks. As such, there were no examples of linking different topics either within or across disciplines to create a more holistic view of the interrelated nature of the environment. There appears to be considerable scope to support the teachers of different disciplines to extend these lessons with information and activities that create links and develop an ongoing and inclusive understanding of the environment and issues connected with it.

Learner-centred approaches

All of the teachers (and the school Directors) endorsed the shifted emphasis in the new ‘Curriculum Framework’ towards learner-centred and interactive pedagogy. In general the teachers understood the approaches and the reasoning behind the use of such approaches. They all described the learner-centered approach as successful and as being better for the students and the teachers, albeit at times noisy and seemingly chaotic when compared with their previous practice. When asked to describe a ‘good’ lesson that they had taught recently, teachers frequently spoke of lessons that involved activities where students were active and interested.

There was a strong endorsement of, and commitment to, the new approaches even though the teachers have not yet fully integrated these pedagogies into their usual practice. The teachers are trying hard, but need support to develop further. The teachers were enthusiastic about the idea of extra activities, particularly if supported with appropriate resources (particularly real objects) that they could use. One of the ongoing difficulties that teachers face with activities is the size of classes. With 50 or more students it is often difficult, for instance for science teachers, to do practical experiments and investigations that the students can undertake themselves. For this reason, together with the limitation of equipment, experiments are often done as demonstrations.

The Directors and Supervisors confirmed the position of teachers as still needing considerable support to fully adopt the new pedagogical approaches. The nature of Environmental Education and the range of activities and resources intended as part of the ESEE Initiative would seem to be ideally suited to facilitating the ongoing professional development of teachers as well as their primary purpose of creating learning opportunities for students.

Clubs

Most schools have Clubs operating, but the frequency of meeting, and the activities involved vary from school to school depending on the teachers who have responsibility for running them. The exact nature of the different Clubs also varies but typically they cover areas such as culture, sport, arts, academic, health, and ‘green’ clubs. Most of the RAP schools had some form of Health Club and about half of them had a Green Club (or Agriculture Club).
Most of the Green Clubs were not currently active as they were waiting for the rains. The Clubs’ activities seemed to be primarily related to maintenance and development of the school grounds including tree planting and watering. The Green Clubs did not yet appear to have adopted the learner-centred approaches being promoted in the classrooms, and there was no evidence of student-led or student initiated projects.

The Green Clubs would appear to offer an excellent opportunity to support more active engagement with the environment through practical projects for example, water harvesting, composting, mulching, targeted watering systems and maybe edible gardens grown using these techniques. Such projects would create numerous possibilities for other school learning activities and may also provide entry points for greater involvement of the wider community.

Students

The students interviewed in the RAP were from Grades 4 and 5. All of the students were interested, engaged and cooperative. Although many of the students were shy and with most groups translators were needed to assist communication, there were always one or two natural leaders who were able to bridge the communication gap. The students were supportive and responsive to each other and keenly followed every interaction.

The stimulus photos excited a lot of interest and the students were able to talk, with prompting, about many of the issues and situations depicted. However, it was also evident that their level of knowledge did not match their level of interest and it appears that the proposed new activities would reach a receptive group of students.
The students generally described science classes as the source of their environmental knowledge, but they were also able to make links to other subjects and to their home experiences. The students understood the environment in terms of their physical surroundings and felt that it was important to learn about because “It is where we live.”

Community Links: PTA

Without exception the enormous support and commitment of the wider community for their school and their children’s welfare was demonstrated by the PTA members who attended the RAP processes. Although attending often involved inconvenience and reorganizing of their time, PTA members participated at each school and were fully involved in discussions. The PTA representatives who attended were uniformly supportive, committed and optimistic.

The perspective that PTA members brought to interactions about environmental issues deepened understanding by including additional dimensions relevant to the community, which located the particular situations of the schools in a broader context. The PTA participants were very knowledgeable about the school and its activities and problems, and often related stories that illustrated a deeper, more intimate, and more active involvement than is usually associated with governance bodies.

From personally fixing furniture through more traditional activities like fundraising, and less common activities like visiting classrooms during lessons, the various members of the different PTAs related a myriad of stories that served to reinforce the importance that the school has within the community. The PTA members were concerned with relationships within the school, and when asked about what constituted a ‘good’ teacher replied firstly in terms of the teacher being a role model and having a good relationship with students, and only secondly did they make reference to subject content knowledge.

Although the PTA was generally satisfied with leaving what was taught to the teachers, they recognized the value of Environmental Education and supported the broad aims of the ESEE Initiative. The PTA in many schools was an active partner in programs like tree planting, and clearly took pride in achievements during walks around the schools. During these walks, several RAP team members had opportunities to talk informally to PTA members and there was enough interest in new ideas and possibilities to suggest that the PTA could provide an entry point for supporting the wider community with practical environmental education.
The ESEE Initiative with its emphasis on learner-centered interactive approaches will provide a further teacher-friendly way of supporting teachers’ ongoing professional development.

**Background**

In 2008, *The National Curriculum Framework for Eritrea (2008)* took effect. The ‘Curriculum Framework’ is a comprehensive document, which sets out the policies and principles for education in Eritrea as well as guidelines for their implementation. This document is forward thinking, progressive and grounded in what is currently understood internationally to be ‘best’ education practice. The document is actively transformative with regard to education in Eritrea.

**Curriculum Pedagogical Approaches**

A key component of *The National Curriculum Framework for Eritrea* is the promotion of interactive learner-centered pedagogies that move classroom practices away from teacher dominated didactic transmission of knowledge. These pedagogical approaches, which act to empower students to take a more active role in their learning, have long been advocated by educators as the most effective and appropriate way of conducting Environmental Education (see for instance Tbilisi Declaration, 1978). The new approaches to classroom delivery represent a major impact on the way that teachers undertake their classroom role, and there has been a program of professional development workshops undertaken to familiarize teachers with the changes and to support their implementation. Nevertheless, as was indicated in the earlier section on ‘Teachers and Teaching’, teachers are still becoming accustomed to the new approaches. The ESEE Initiative with its emphasis on learner-centered interactive approaches will provide a further teacher-friendly way of supporting teachers’ ongoing professional development.

**Curriculum Content**

*The National Curriculum Framework for Eritrea* is not prescriptive as to curriculum content, but it does outline the Core Learning Areas and how teaching time will be allocated. The introduction of the ‘Curriculum Framework’ has been supported with the development of Expected Learning Outcomes for each area and level of study and
the rewriting and trialing of textbooks and accompanying teacher guides. The teacher guides contain specific knowledge content, activities and teaching approaches for the key subject areas of Mathematics, Social Studies, English, Science and Mother Tongue. There are also a text book and teacher guide for Life Skills which is taught for one hour per week at each grade level. The process of trialing of text books and teacher guides is currently nearing completion. Of particular note to this ESEE Initiative is the inclusion of Environmental Education as a cross curricular theme in The National Curriculum Framework for Eritrea. In line with these guidelines, most of the textbooks include topics that have environmental themes, or can link to environmental themes.

Curriculum Analysis

A major part of the work of the RAP Team has been to undertake an analysis of the current curriculum in order to establish exactly where and how issues relating to the environment are currently being taught. The establishment of this baseline information is a necessary part of planning how the teaching of Environment Education can be strengthened and extended.

The curriculum analysis has involved the detailed mapping of all environmental content to be found in Expected Learning Outcomes, text books and teacher guides. This information has been recorded in the form of a matrix showing subject, grade level, topic, key concepts, and highlighting where links to Environmental Education exist or can be made. As Elementary Education is taught through a mother tongue medium, much of this work has involved working with translators or with the support of bilingual colleagues from the Ministry of Education.

In order to develop a more complete understanding of the curriculum, meetings were held with members of the Curriculum Panels, who are responsible for the development of text books and teacher guides. This has been particularly helpful as some of the text books and teacher guides are not yet in a final form. It has also allowed the researchers to tap into the expertise of these panelists, and to gather their views on how best to implement Environmental Education in the elementary schools.

Once the mapping of the Environmental Education components of the curriculum was completed, a cross checking process was undertaken to match the components to international ideas about environmental education. The Australian approach to Environmental Education, which is articulated in A Framework for Environmental Education for Sustainability was used for this process. This Framework is based on international developments in environmental thinking and in teaching and learning in Environmental Education. As such, it represents current international best practice. The checking of the curriculum against this Framework indicated where supplementary materials might be required to ensure that the final outcome is of world standard.

Finally, the curriculum coverage was checked against the environmental issues of priority in Eritrea. This was done to investigate how well the curriculum is preparing the young people of Eritrea to develop behaviours that actively contribute to the abatement of problems in their environment.
The finding from the curriculum review is that Environmental Education is occurring across all areas of the elementary curriculum, however Science and Social Studies have more environmental content than other areas. The text books and teacher guides present a good range of environmental education themes. However the focus could be broadened to encompass a Sustainable Development model. There are some opportunities currently for cross curricular work, however these could be strengthened and extended, for example, by aligning themes across grade levels to occur at the same time of the year.

Teachers would benefit from further development of their own knowledge base, and suggested activities that support the children to ‘learn through doing’. They would also benefit from the provision of additional practical equipment and resources, and detailed guidance on Environmental Education approaches.

The cross checking process against the *Australian Framework for Environmental Education for Sustainability* has raised the following points:

- Firstly, that involvement of the whole school community will be necessary in order to effectively educate students in Environmental Education. The active involvement of the PTAs in their school communities provides an ideal connection for environmental education to reach the broader school community. Resources should be provided to the PTA to ensure that they are actively engaged in supporting Environmental Education within the school. Within regional areas the possibility could be explored of also involving the village administrative committee in the environmental education initiatives of the school. The school could inform the community by operating as a demonstration site for environmentally friendly practices.

- Secondly, the majority of the environmental education that is written into the curriculum is “education about the environment”. The curriculum could be extended to include more learning experiences for students ‘in the environment’ and ‘for the environment’. Children need to learn from an early age that behaviour which actively conserves the environment and reduces human impact is vital to sustaining their own well being in the future.

- Thirdly, children need to understand the interdependence of people, and the need to work together to preserve and improve the environment. Developing the necessary knowledge, skills, understandings, values, and actions in children is important, however this is enhanced when they understand that social participation by everyone: children, adults and the elderly is necessary for the wellbeing of Life on Earth.

The move to a Child Centered Pedagogy, which is part of the implementation of the new Curriculum Framework, is ideally suited to the teaching of Environmental Education. In preparing supplementary materials to support schools, it will be important to build on the work already happening in this area, and to actively encourage teachers to extend their environmental content knowledge and pedagogical skills.

**Other Findings**

During the undertaking of the RAP, the research team identified a number of potential sources of material and information, which could enhance the writing stages of the ESEE Initiative. In particular, there are numerous educational messages and resources related to themes of interest to this project, which are being produced and disseminated to schools and communities by different government Ministries and their project partners. Wherever possible, the messages and materials produced by the ESEE Initiative will align with and support these other messages. Ministries and Departments important to this process include: Eritrean Demining Authority, Ministry of Agriculture, Ministry of Fisheries, Ministry of Health, and the Ministry of Environment.
Key Finding 1

The environmental issues of most concern to all school stakeholders were those that impacted most closely on their daily lives. The priority given to these issues varied for each community and was linked to the immediate environment and community well-being. The major issues identified were:

- **Water**: There is concern in all communities about water scarcity and/or water quality
- **Drought**: Drought is the extreme manifestation of water shortage and is seen as the most likely and most significant of natural disasters. People generally feel powerless against the threat of drought
- **Sanitation**: A lack of adequate sanitation infrastructure is an important issue in both schools and the wider community. Students can’t practice what they know about healthy sanitation practices. Particularly with regard to washing
- **Plants – Deforestation**: Cutting of trees for fuel is a major concern. Forest cover has dropped to less than 1% of Eritrea, and people most closely associate desertification with cutting of trees
- **Plants – Food Security**: Linked closely to water scarcity, food security is the major concern of rural agriculture communities but also features highly among the concerns of city school communities
- **Other issues** mentioned were of much lower concern and included; pollution, conservation, urbanisation, and school environmental security concerns like fencing
- Although introduced separately into discussions the issues raised were understood to be interconnected and interdependent
- **Specific Recommendation**: These issues should have a strong representation in the materials produced to maximise the linking of environmental education to daily lives. Information, activities and projects that act to mitigate some of the impacts of the priority issues can be developed to build capacity at the classroom, school club, and community levels
Key Finding 2

Water scarcity and financial restraints create perceptions that further environmental projects and learning activities are not possible, or are extremely limited in the schools. However, the limitations need not stop such activities completely.

- Walks around the schools and conversations with school administrators and PTA members identified several possibilities for projects and authentic learning experiences, which could be possible within the existing restraints

**Specific Recommendation:** Writers of materials should be cognisant of limitations and activities should be tailored to the reality of constraints, but should should where possible actively involve water and water related issues.

Key Finding 3

Plants and in particular trees and crop plants are the main way that people interpret their active involvement with the environment.

- All stakeholders connected plants (particularly trees) to environmental health and community well-being
- In school environments, plants are primarily trees and considerable effort has been invested in planting programs
- Plants are important for more than their functional uses, and considerable pride and appreciation of established trees and gardens was evident.

**Specific Recommendation:** Plants and the interrelated ways that they connect to the environment represent an important way of connecting different ideas and activities. They also provide an existing link to the wider community that could be developed with targeted projects

Key Finding 4

The new ‘National Curriculum Framework’ is transformative and is having a significant influence on the teaching and learning in classrooms.

- The most significant impact is on teaching methods, with interactive, learner-centred approaches favoured
- The Curriculum Framework is supported with rewritten text books and teacher guides
- There is a (temporary) impact associated with the trialling of the new textbooks and insufficient copies
- The new ‘Curriculum is actively supported by teachers and administrators, and anecdotally by students (they enjoy interactive lessons). The ‘Curriculum Framework’ includes Environmental Education as a cross-curricular theme

**Specific Recommendation:** Materials produced should align with the Curriculum Framework’s pedagogical guidelines and text books’ content

Key Finding 5

Teachers teach one or two subjects only and follow textbooks and teacher guidelines closely. They would need support to engage with environmental education material that extends their knowledge base beyond their normal classroom practice.

- There are many younger teachers who have not yet built up their knowledge and confidence to work outside of the teacher guidelines
• Teachers’ knowledge and experience is very subject and often Grade specific and they struggle with cross-curricular themes

• Environmental topics are included in most of the subject textbooks, but as isolated topics with the emphasis on the subject related learning outcomes rather than as contributing to a broader vision of Environmental Education

**Specific Recommendation:** Material produced should be linked to the subject textbooks and should support teachers to make the links to broader environmental themes and the extended understanding of issues that results. A teacher-friendly ‘Curriculum Companion’ is suggested.

### Key Finding 6

*Interactive and learner-centred pedagogies are understood and supported by the teachers, but they need further support to operationalise these approaches and to incorporate them into their routine practice*

• The change in emphasis with regard to teaching strategies and practice is relatively new and teachers need ongoing support to incorporate these pedagogical approaches into their routine activity

**Specific Recommendation:** Materials produced should include a lot of interactive and learner-centred approaches that would allow teachers to increase their range of skills. These materials should be accompanied by teacher guidance (in the Curriculum Companion) that details the approaches that can be used with each activity

### Key Finding 7

*Teachers value teaching aids and practical activities but need many more resources to teach inclusive Environmental Education*

• Many schools have a good range of charts designed for front of the class teaching but have limited other resources, particularly ‘real objects’

**Specific Recommendation:** The ‘toolboxes’ of resources that accompany this project should contain ‘real objects’. Teachers would be encouraged to use the environmental education activities in their teaching if the resources were available. The ‘real objects’ should be linked to the project activities but where possible also be usable in other contexts

### Key Finding 8

*Clubs are present in most schools and many have a version of a ‘Green Club’. Most of these Clubs are limited to planting and watering trees.*

• Green Clubs do not yet appear to have adopted the learner-centred pedagogies, which are being promoted for classroom practice. There was no evidence of student-led or student initiated projects.

• Green Clubs appear constrained by the availability of water and many were inactive during the dry season

**Specific Recommendation:** Clubs, particularly green clubs or agriculture clubs should be supported with separate materials that encourage students to be actively involved, and that support a wider range of activities in all seasons
Key Finding 9

There are very strong supportive relationships between the schools and their PTAs and involvement of the whole school community through the PTA will strengthen environmental education

- PTAs of different schools operated in different ways but all showed interest and commitment beyond the strict role of governance
- PTA members were interested in the environment both through their own close association with it and through their particular support for tree planting projects in schools
- The PTA members interviewed were supportive of the aims of the ESEE Initiative

**Specific Recommendation:** The PTAs seem to offer an excellent way of connecting in-school activity to the wider community, and a separate resource could be prepared to support community Environmental Education - maybe a Community Handbook. Some projects (for instance an ‘edible garden’) could be designed to encourage greater community-school interaction

Key Finding 10

Various Ministries, Departments, and their partner organisations including the Ministry of Education are already producing environment related messages and/or resources that are being distributed to schools and communities

**Specific Recommendation:** Materials produced by this project should where possible align with, and maybe incorporate the messages conveyed by these other parties. Materials produced should supplement and extend, rather than duplicate existing resources and activities.

Key Finding 11

Environmental education is being taught across the curriculum but particularly in Social Studies and Science. However, the focus of the curriculum is on learning ‘about’ the environment rather than ‘in’ or ‘for’ the environment.

- Teaching of environmental topics is most common in Science and Social Studies where students are taught about environmental related issues. International studies suggest that teaching ‘about’ issues should be accompanied by learning that is carried out in the environment and opportunities should be created for students to take action ‘for’ the environment
- Some education ‘for’ the environment occurs with for example tree planting programs, but this tends to be extracurricular.
- Other subjects tend to use environment topics as context for other learning objectives

**Specific Recommendation:** Science and Social Studies should be supported with activities that create opportunities to extend students with education ‘in’ and ‘for’ the environment. Other subjects should also be supported to engage the environmental issues in their own right alongside subject learning objectives.

Key Finding 12

There is some cross curricular work however it could be extended and strengthened

- The ‘National Curriculum Framework’ supports a cross-curricular approach

**Specific Recommendation:** Where possible materials produced should support the linking of specific subject environment inclusions to other subjects to encourage the development of a critical, multidiscipline and integrated view of the environment and environmental issues.
Implications for Environmental Education materials

From these specific recommendations related to the key findings of the RAP processes, the following 6 general recommendations are offered as a way of taking the project forward into the next phase of writing and producing educational materials for enacting effective Environmental Education in Eritrea.

- Materials produced should be aligned to, and extend, the existing curriculum content as represented by the Expected Learning Outcomes, textbooks and Teacher Guides of core subjects. They should do this by means of:
  - Using learner-centred interactive pedagogy
  - Being organised by subject and Grade level
  - Constructing, where possible, themes that link in a cross-curricular way and provide iterative spiral connections through successive Grades.
  - Being strongly activity based
  - Creating opportunities for authentic learning experiences
  - Providing an easily usable ‘Curriculum Companion’ for teachers, which guides them through activities they can use to deliver the environmental content of their lessons better
  - Providing additional resources that extend teaching possibilities

- Materials produced should be coordinated to encourage a holistic whole school approach to Environmental Education by supporting extra-curricular activity and community engagement as well as classroom practices.

- Extra-Curricular Clubs can be strengthened by provision of separate material and be used as entry points for wider community engagement.

- To facilitate community engagement, a ‘Community Handbook’ could be compiled and distributed through the PTAs.

- Messages and activities included in the material should be aligned to and supplement rather than replace existing messages carried to schools and the wider community by other Ministries and their partner organisations.

- The reality of water shortage and financial constraints must underpin considerations of appropriate material and activities. Activities must draw on up to date science related to dry land agriculture and sanitation, and should use appropriate low cost technology.
Conclusions and Final Comments

Education is an important element in strategies to develop sustainable communities, and understanding communities is an important element in developing appropriate and responsive education. This RAP process comprised two complementary elements as the first stage of an initiative aimed at supporting Elementary School Environmental Education in Eritrea (ESEE Initiative) with specifically developed materials, activities and resources, and supported with teacher training. It firstly involved on-site collection in school communities, of environmental perceptions and data related to actual teaching and learning in schools. Secondly it sought to build an understanding of the broader educational context in which the schools operate. It did this by talking to key Ministry of Education staff about the steps that were already being taken to incorporate Environmental Education in Elementary Schools in Eritrea, and by reviewing the National Curriculum Framework, textbooks, and teaching materials.

The first stage of the RAP process revealed that environmental issues are of real concern to schools and their wider communities, particularly those issues that impact most closely on their daily lives, specifically; water, sanitation and plants. All the school stakeholders considered that effective environmental education is important, and supported in principle the strengthening of Environmental Education in their schools and community. The RAP process also revealed that schools are integrated communities and that materials produced should support not only the formal curriculum but extra-curricular clubs and the wider community as well. Such an inclusive approach would create a more holistic understanding of environmental issues and lead to more effective environmental education.

The second stage of the RAP process was aimed at understanding the educational reform already instigated by The Ministry of Education, so that any material produced by the ESEE initiative was complementary to what was already being done. The RAP revealed that environmental issues are included in many of the textbooks, although their inclusion often only teaches ‘about’ the environment and does not emphasise the important action component of education ‘for’ the environment. There is scope to deepen, enrich and extend the current curriculum content with activities and material that encourages action-based learning, and which strengthens cross-curricular links.
The teaching methods being promoted in *The National Curriculum Framework for Eritrea* are those that environmental educators internationally recommend. Specifically, interactive and learner centred approaches are advocated. However, it was also recognised during the RAP that there is no coordinated environmental education strategy and that teachers need support to engage both in the material content, and also the new teaching methods.

It is suggested here that the ESEE Initiative of which this RAP is a part, is timely in that the type of Environmental Education it promotes is ideally suited to helping bridge the transformative intentions of the national education strategies and the reality of practice in classrooms. Environmental Education materials developed in the next stage of this project will be closely aligned with the content already included in the subject textbooks, and will utilise interactive and learner-centred pedagogies. This approach will extend the existing material and help to develop a coordinated cross-curricular approach to Environmental Education. In this way, the material produced will support both students and teachers. The RAP has also concluded that holistic inclusive Environmental Education is best achieved with a whole community approach, and therefore the project will also aim to support extra-curricular school Green Clubs and wider community engagement by producing separate material for these groups.

**Way Forward**

It is evident that the next stage of the project can be built on three strong pillars of the Eritrean education system; a progressive vision for education at the highest administrative and strategic levels, the endorsement and support of teachers and directors at classroom level for the new approaches, and strongly supportive school communities. It is concluded in this RAP, that the ESEE Initiative can usefully support all three of these components of education. There is considerable scope to design materials that would complement and strengthen the initiatives that are already underway. In doing so, it is evident that all stakeholders can be supported to engage with the new materials including teachers, students and community members.

Finally, in bringing this report to a conclusion the RAP team considers that the way forward is one full of optimism. The optimism is in part engendered in the sincere interest and unfailing hospitality that was encountered in the school communities, combined with the school stakeholders’ determination and commitment to building strong and effective education for their children. In part also the optimism reflects the support extended by Ministry staff who are in the process of rebuilding education, and the willingness they have shown to examine new ideas and adopt those that will help them on the path they have already begun towards a more sustainable future. The RAP process appeared to genuinely engage current stakeholders in education who are encountering environmental issues in their daily lives, and who are working hard for the next generation of Eritreans. The team who worked to produce this report has a strong conviction that the next phase of the project will produce materials and a toolbox of resources that will be appropriate to the Eritrean context and will help the vigorous efforts that have already begun towards the goal of educating children to become fully participating members of a sustainable and vibrant Eritrea.
Appendices

Appendices

- Appendix 1: RAP Stakeholders
- Appendix 2: School Profiles
- Appendix 3: Curriculum Analysis Framework

References

Graphs, Maps and Diagrams

- Map 1: Eritrea showing Zobas and Participant Schools
- Map 2: Eritrea Rainfall
- Map 3: Eritrea Ethnic Diversity
- Graph 1: School Teacher Numbers
- Graph 2: School Student Numbers
- Graph 3: Ratio of Boys to Girls in schools
- Graph 4: Frequency of Perceptions of Environmental Issues
- Diagram 1: UNESCO’s model of the interlocking dimensions of sustainability
- Diagram 2: Whole School Engagement
Appendices

Appendix 1: Key Stakeholders in RAP

Ministry of Education, as the principal Eritrean Government partner in this project
Also other government Ministries as contributors to, and potential users of the materials produced by the ESEE Initiative
- Ministry of Land, Water and Environment (Water Resources Department)
- Ministry of Health
- Ministry of Agriculture
- Ministry of Fisheries

UNICEF as the implementation agency
Live & Learn Environmental Education as a consultant to UNICEF and as an implementing partner of the ESEE Initiative

Government of Japan as the Funding Aid Agency

Eritrean Elementary School Students as the recipients of the ESEE Initiative
Eritrean Elementary School Teachers as recipients of the ESEE Initiative in their own right and as teachers delivering the student oriented components of the ESEE Initiative

Other stakeholders
- School managers, curriculum writers, education officers,
- PTA and communities

Appendix 2: Participating Schools’ Profiles

Godaif Elementary School
Zoba Maekel: One of the oldest established schools in Eritrea. In Asmara, Godaif is a fairly large school of 1300 students and 32 teachers

Selemuna Elementary School
Zoba Maekel: Selemuna is a medium sized school in Asmara with just under 600 students and 21 teachers.

Kehawta Elementary School
Zoba Maekel: A medium sized school in Asmara of close to 600 students and 18 teachers

Adi Sokdo Elementary School
Zoba Maekel: A fairly large school in Asmara of over 1200 students and 35 teachers

Woki Elementary School
Zoba Maekel: Outside Asmara, Woki is a small school of 351 students and 9 teachers

Zagir Elementary School
Zoba Ansebar: A medium sized school outside Asmara. Zagir has 500 students and 12 teachers

Emberemi Elementary School
Zoba North Red Sea: Emberemi is a small rural school of 180 students and 6 teachers

Foro Elementary School
Zoba North Red Sea: Foro is a medium sized school of 500 students and 10 teachers

Selam Elementary School
Zoba Ansebar: Selam is one of the oldest schools in Eritrea. It is a very large school close to Keren of 1700 students and 50 students.

Elementary School
Zoba Ansebar: Semaatat is a fairly large school in Keren of over 1300 students and 38 teachers

Dekemhara Elementary School
Zoba Ansebar: Dekemhara is a medium sized school of over 500 students and 28 teachers
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<td>1.2 How to look after yourself.</td>
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<td>1.3 Wear clean clothes</td>
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<td>4.4 Differences between living and non-living things</td>
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<td>3. Subtraction with images, numberlines, symbols</td>
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## Concepts and Principles of environmental education for sustainability

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<td>Observing weather</td>
<td>What did our parents do to keep healthy?</td>
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*Planting trees if the school has a Green Club also planting succulents and a vegetable garden

Ref: Pg 16 Educating for a Sustainable Future
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<td></td>
<td>Social studies</td>
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<tr>
<td>Environmental security</td>
<td>English</td>
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<tr>
<td>Energy</td>
<td>Science</td>
<td></td>
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</tr>
<tr>
<td>Habitats</td>
<td>Social Studies</td>
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</tr>
<tr>
<td>Waste Management</td>
<td>Science</td>
<td></td>
<td>Clean the school yard</td>
</tr>
</tbody>
</table>
Environmental Issues – with examples of possible activities

<table>
<thead>
<tr>
<th>Environmental Issues</th>
<th>About the environment</th>
<th>In the Environment</th>
<th>For the environment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Water</strong></td>
<td></td>
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</tr>
<tr>
<td>Scarcity –</td>
<td>Science</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quality – sanitation</td>
<td>Science, Social Studies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drinking</td>
<td>Science, Social Studies</td>
<td>Water testing</td>
<td>Water testing, Water purification</td>
</tr>
<tr>
<td><strong>Plants</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Health</strong></td>
<td></td>
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<tr>
<td><strong>Sanitation</strong> – toilets</td>
<td></td>
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</tr>
<tr>
<td><strong>Washing</strong></td>
<td></td>
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<tr>
<td><strong>Health</strong></td>
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<td></td>
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<tr>
<td><strong>Fencing</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Conservation</strong> – soil</td>
<td></td>
<td>Visiting sites to soil test</td>
<td>Soil examination</td>
</tr>
<tr>
<td>- Water</td>
<td>Science, Social studies</td>
<td>Looking at sites in the school where water could be harvested</td>
<td></td>
</tr>
<tr>
<td><strong>Pollution</strong></td>
<td></td>
<td>Looking at pollution in the schoolyard, in the local community</td>
<td></td>
</tr>
<tr>
<td><strong>Urbanisation</strong></td>
<td></td>
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<tr>
<td><strong>Overcrowding</strong></td>
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<tr>
<td><strong>Plants</strong> – Deforestation</td>
<td></td>
<td>Tree planting</td>
<td>Tree planting</td>
</tr>
<tr>
<td>- Food security</td>
<td>Tigrinya</td>
<td>Vegetable gardens &amp; fruit trees</td>
<td>Vegetable gardens &amp; fruit trees</td>
</tr>
<tr>
<td>- Desertification</td>
<td></td>
<td></td>
<td>Tree planting</td>
</tr>
<tr>
<td>- Forage</td>
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</tr>
<tr>
<td><strong>Biodiversity</strong></td>
<td>Science</td>
<td>Looking at trees in the schoolyard, or local community, Auditing wildlife in the schoolyard</td>
<td>Sharing audit with Department of Forestry and Wildlife</td>
</tr>
</tbody>
</table>
Environmental Issues – with examples of possible activities

<table>
<thead>
<tr>
<th></th>
<th>&amp; local community</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Animals</strong></td>
<td>Science</td>
<td>Auditing wildlife in the school yard &amp; local</td>
</tr>
<tr>
<td></td>
<td>Social studies</td>
<td>community</td>
</tr>
<tr>
<td><strong>Environmental security</strong></td>
<td>English</td>
<td>Sharing audit with Department of Forestry and</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wildlife e.g. Bird</td>
</tr>
<tr>
<td><strong>Energy</strong></td>
<td>Science</td>
<td></td>
</tr>
<tr>
<td><strong>Habitats</strong></td>
<td>Social Studies</td>
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</tr>
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<td><strong>Waste Management</strong></td>
<td>Science</td>
<td>Clean the school yard</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Audit waste and suggest solutions to resolve</td>
</tr>
<tr>
<td></td>
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<td>litter problem</td>
</tr>
</tbody>
</table>

*Grey shaded boxes indicate examples of learning experiences that could be extensions of curriculum that address expected learning outcomes but are conducted ‘in’ and ‘for’ the environment*
References and Background Material Utilised


Eritrea Profile (13/06/09) Conserving Land and Water = Securing Our Common Future


Ministry of Education, Department of General Education, Division of Monitoring and Quality Assurance (2005) Training Module: Learner Centred and Interactive Pedagogy


Ministry of Education of Eritrea; Department of General Education, Curriculum Planning and Development Division (2007-2009); Elementary School Textbooks and Teacher Guides, including draft versions of the following subject areas and grade levels:

- **Tigrinya Grades 1-5**
- **English Grades 1-4**
- **Social Studies Grades 4-8**
- **Mathematics Grades 1-5**
- **Science Grades 1-8**
- **Life Skills Grades 4-5**

Ministry of Education of Eritrea; Department of General Education, Curriculum Planning and Development Division (2007-2009); Subject Syllabi for English, Social Studies, Mathematics, Science and Life Skills


Graphs, Maps and Diagrams

Map 1: Eritrea showing Zobas and Participant Schools

Map 2: Eritrea Rainfall

Map 3: Eritrea Ethnic Diversity
Graphs, Maps and Diagrams

Graph 1: School Teacher Numbers

Graph 2: School Student Numbers

Graph 3: Ratio of Boys to Girls in schools

Girls 45%  Boys 55%
Graphs, Maps and Diagrams

Diagram 1: UNESCO’s model of the interlocking dimensions of sustainability

Diagram 2: Whole School involvement

Graph 4: Frequency of Perceptions of Environmental Issues