

Rapid Assessment of Perceptions

Environmental Education in Grades 4-6, Timor-Leste

March 2011





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LIVE & LEARN
Environmental Education

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Research and RAP report by Live & Learn Environmental Education, 2011



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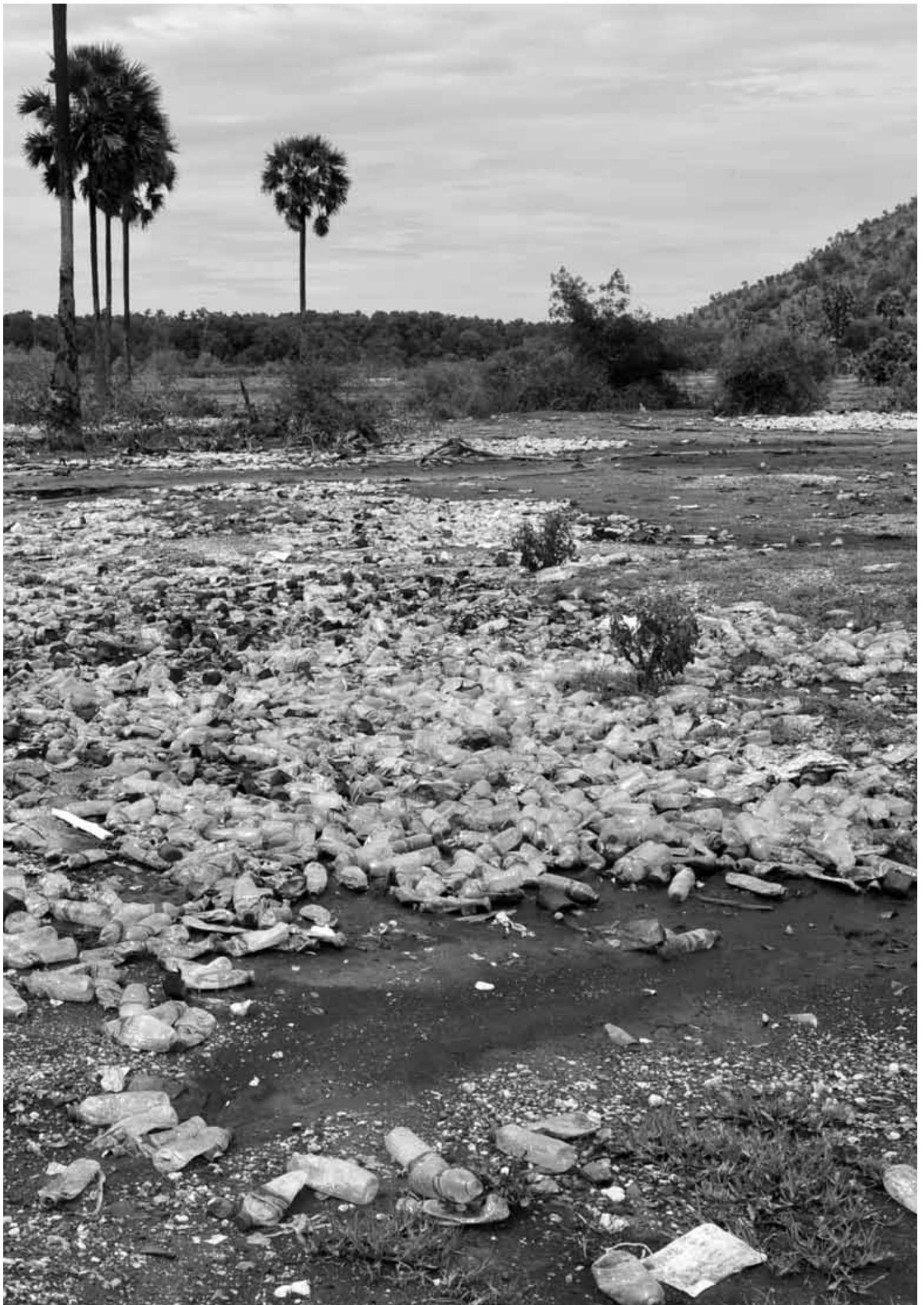
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Executive Summary

From 28 February to 13 March 2011, Live & Learn Environmental Education (Live & Learn) undertook a Rapid Assessment of Perceptions (RAP) on the current status of environmental education in the elementary education in Timor-Leste. Funded by UNICEF Timor-Leste, a key aim of the RAP was to identify opportunities for strengthening the teaching and learning of environmental education in elementary level schooling.

It involved research in four schools together with a review of curriculum. The team also met with the Ministry of Education Curriculum Branch, UNICEF staff, FAO staff and CARE Timor-Leste.

The findings indicate that there are strengths within the schools, and highlight the need for further work to enhance student centered teaching and to strengthen the ability of teachers to effectively deliver environmental education.

The report recommends the establishment of an environmental education initiative with 3 phases focusing on resource development, teacher training and student leadership. These phases are interlinked and mutually complementary. It recommends that the first phase of the initiative should focus on strengthening the capacity of teachers to deliver environmental education in Grades 4-6 with a particular focus on the Estudo Do Meio curriculum. This stage should involve the development of relevant resources to support teacher training and improved delivery of environmental education. It further recommends that this phase should involve the development of a set of student resources which would assist the teachers in their delivery of environmental education. A program design for the 3 phases is included within this document.

The report recommends the establishment of an environmental education initiative in which 3 interlinked phases are developed and implemented over time.

Summary of Findings & Recommendations

Finding from the schools

Strengths

1. The Ministry of Education is committed to positive change in Basic Education through improvements in school infrastructure, access and equity, teacher quality, curriculum and school management.
2. Despite very challenging circumstances, schools are functioning in a professional way. All schools visited had hard working School Directors and teachers, timetables for classes, text books for most subjects, basic school room furniture and some learning resources.
3. Plans are in place through The National Education Strategic Plan 2011-2030, to improve the availability of text books and accompanying Teachers' Books.
4. Schools are making good progress in involving parents
5. Teachers are enthusiastic about improving their teaching and would like further training in student-centred teaching methods.
6. Teachers were aware of environmental problems such as landslides being caused by cutting down trees. While they did not appear to have a systems view of the environment, they did identify local problems and are interested in ways to improve the environment.
7. Teachers believe it is important that students learn about the environment and how to protect it. They are keen to learn more about the environment and to improve how they teach environmental topics in Estudo Do Meio.
8. Considerable investment is being made to improve teacher quality through in-service training.
9. The students enjoy active learning but report they do not presently do such activities in class.
10. Students have a basic knowledge of species and they are interested to know more about what exists in their local area.
11. Students have some knowledge of health and hygiene which can be built on.

Areas for development

1. Teachers are struggling with the implementation of student-centred learning and need support to move to a more active and engaging style of teaching.
2. Teachers need help to strengthen their own knowledge base regarding environmental issues and to move their own thinking to a more systems based approach.
3. The effectiveness of in-service training could be enhanced by using an extended model of training.

Findings from the Curriculum Analysis

1. The Estudo Do Meio curriculum for Grades 4-6 does touch on a range of environmental topics.
2. The approach to environmental topics is not systems based and does not show the interconnectedness of natural and human systems.
3. Sustainability is not an underpinning theme in the treatment of environmental topics.
4. The presentation of environmental topics is knowledge based. It does not connect well to the real life of students and it does not deal with student's values about and attitudes to the environment.
5. It does not encourage students to take action that will help them, their families and their communities to live more sustainably.
6. The domains of competency in the curriculum do support group work and enquiry learning however this is not translated effectively into the text books.
7. Given the limited educational background of many teachers, the information on environmental topics contained in the Teachers' Book which accompanies the text book is not sufficient to enable teachers to adequately present these topics.
8. There are a number of environmental problems facing Timor-Leste which are not covered in the curriculum.

Recommendations

1. A program of in-service teacher training should be run to improve the teaching of environmental education in Estudo Do Meio, particularly at the Grades 4-6 level.
2. Teaching and learning resources should be developed to support the delivery of environmental education. The resources should focus in the first instance on Estudo Do Meio in Grades 4-6. Some resources such as posters should also be developed to support the teaching of Physical Education, Health and Hygiene. Activities should be included which link to the Art and Culture and Tetum curricula.
3. The Grade 4-6 resources should contain
 - Support materials for teachers
 - Learning materials for students
4. Further detailed work will be needed in order to finalise the instructional design approach to these materials. One option which should be considered is to develop child centered self paced Learning Guides for students using a similar approach to the Escuela Nueva Foundation in Colombia.
5. Materials should include both Portuguese and Tetum text.
6. Consideration should be given to extending the development of resources to cover the Years 1-3 and Years 7-9 with a particular focus on environmental education in the Estudo Do Meio curriculum.
7. Consideration should be given to expanding the role of school inspectors to include supporting improvements in the teaching of Estudo Do Meio. Training should be provided for school inspectors in using the environmental education teaching and learning resources. In addition a DVD could be developed for their use which demonstrates some of the recommended activities.
8. A resource should be produced to support the involvement of the Parents' Committees in improving the school environment.
9. All project work should be done in close collaboration with the Ministry of Education.
10. The establishment of school gardens should be actively encouraged to promote food security and foster student leadership.
11. Further work should be done to ensure that environmental education initiatives do not duplicate but rather capitalize on work already done by UNICEF and other UN agencies, National Institute for Teacher Training, NGOs and the Ministry of Education. Close and co-operative relationships with other agencies in the field of education should be fostered throughout the project.
12. In the longer term, as the Basic Education curriculum is reviewed and new curriculum and learning resources are developed, Environmental Education should be fully integrated, with sustainability as an underpinning theme across all grades in Basic Education.



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Introduction

Background to the project

In January 2011, Live & Learn Environmental Education (Live & Learn) was invited by UNICEF Timor-Leste to undertake a scoping study of environmental education in the elementary school system, and to identify opportunities for strengthening the teaching and learning of environmental education in elementary level schooling.

To meet this brief, Live & Learn undertook a Rapid Assessment of Perceptions (RAP) in Timor-Leste from 28 February to 13 March 2011.

A RAP uses a qualitative methodology which captures perceptions of particular issues and the aspirations of individuals and communities.

These insights provide an invaluable contribution to the development of educational strategies which are relevant to the project participants and which reflect their lives. In this case, the RAP focussed on capturing the perceptions of elementary teachers in Timor-Leste, and key stakeholders such as government officials, donor bodies and aid agencies.

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The objectives of the RAP were to:

1. Ascertain the extent of teachers' understanding of Environmental Education and what they perceive environmental education can do.
2. Identify curriculum links, strengths and opportunities for the mainstreaming of Environmental Education;
3. Inform the writing and content of education and learning resources; and
4. Inform Monitoring and Evaluation of impact.

Key research questions for the RAP were:

- i. How do teachers perceive elementary environmental education?
 - b. What are the current environmental education practices?
 - c. What are the perceived environmental problems on which environmental education could have the greatest impact?
 - d. What challenges and opportunities lie ahead to address these issues?
 - e. What does a successful environmental project look like?
- ii. What are the student's perceptions of the environment?
 - a. What are the students' greatest environmental concerns and why?
 - b. Who is perceived to have access/control over the benefits from natural resource economies (at present and in the past)?
- iii. What are the current curriculum links (desk review and Ministry of Education)?
 - 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?



Scope of the RAP

The RAP was undertaken from the 28 February to 8 March 2011 in Timor-Leste. Researchers visited one school in Dili and three schools in rural communities.

- EPP Bairo Pite, Dili
- EPP 1 Mabaure-Vaviquinia School, Liquica
- EPP Daisoli School, Aileu
- EPP de Lifau School, Laleia, Manatuto

The sites were identified in partnership with UNICEF and the Ministry of Education (MoE). At the schools, the researchers met with the School Director, held a focus group and undertook activities with a group of teachers, and a group of students. In total the researchers met with four school directors, 17 teachers and 26 students. Brief profiles of the schools are provided at Annex 1. Details of the activities are provided at Annex 3.

The researchers met with the Director of Curriculum, Learning Resources, and Evaluation at the MoE, UNICEF staff, FAO regarding their school gardens project, and with CARE Timor-Leste who produce Lafaek (a magazine produced for schools in Timor-Leste).

The team also undertook a curriculum analysis. They looked in detail at the curriculum, Teachers' Guide, student text books and accompanying teachers' books for Estudo Do Meio for Year 1-6. In addition they looked at the Curriculum and Teachers' Guide for Physical Education, Health and Hygiene and for Arts and Culture. Classroom materials are still being prepared for these subjects. The Estudo Do Meio curriculum for Years 4-6 was mapped to identify where environmental topics are covered, the extent to which environmental problems facing Timor-Leste are covered in the curriculum, and a sample mapping of one topic was done against a best practice model. Details of this curriculum analysis are provided at Annex 2

The RAP is designed as a rapid method to gain insights into an issue. In this case the timeframe for research, analysis and writing was very short. In the event of a project being funded, additional work needs to be undertaken, in particular further consultation with other agencies working with schools is required. This includes; UN agencies the National Institute for Teacher Training and relevant NGOs. This will be important in order to avoid duplication of effort, and to ensure that the work undertaken with schools is

well co-ordinated. It will also be useful to draw out the lessons learned through the implementation of other education initiatives such as the Fast Track Initiative which focused on improving literacy and numeracy skills in the early years of Basic Education. Further detailed meetings will obviously need to be held with the Curriculum, Learning Resources and Evaluation Division and other Divisions of the MoE. More detailed curriculum mapping is required particularly as text books become available for additional subjects. It will also be helpful to have discussions with some Parents Committees at schools in order to gain an insight into their views.

As part of this study, the research team worked closely with an interpreter fluent in both Portuguese and Tetum. Interviews at schools were conducted in Tetum with summary translation rather than word by word translation. It was possible to do some direct cross checking of perceptions, as one member of the team was a Bahasa speaker. Teachers and School Directors in all schools spoke Bahasa and some children were also able to understand and communicate in Bahasa.

Importance of Environmental Education in the Timor-Leste context

There can be few more pressing and critical goals for the future of the people of Timor-Leste than to ensure steady improvement in the quality of life for current and future generations in ways that respect the needs and rights of all, and the fragility of the natural environment.

Environmental Education, or education for sustainability, can make a real contribution to achieving a sustainable future for Timor-Leste in a number of ways.

Firstly, it helps students develop the knowledge, skills, attitudes and motivation to take action to achieve a sustainable future. It helps students understand how the natural world works through interconnected and interdependent systems, and how this in turn connects with, and is affected by, human social and economic systems. It helps students connect what they do at school to their family and community. It gives students knowledge, tools, and practical experiences and helps them move beyond knowledge to action. Ideally by the time students complete their basic education,



they should have a strong understanding of the critical environmental issues facing Timor-Leste, and have experienced designing, implementing, and evaluating actions at a local level which address these problems.

Secondly, the teaching of Environmental Education promotes a student-centered approach to teaching and learning. Students learn through active strategies such as observation, development and practical testing of hypotheses, scoping problems and testing of possible solutions, working out risks, identifying intended and unintended consequences, and envisioning possible futures. Students are engaged in understanding and reviewing their own values and those of others. The educational processes are engaging, active and challenging for students. Importantly through improving Environmental Education, teachers learn to more effectively manage large classes, and to make their classes more engaging. When teachers develop the skills to deliver Environmental Education effectively, they develop teaching skills which can be used in all areas of the curriculum. Strengthening the teaching of Environmental Education provides an entry point for strengthening teaching generally.

Thirdly, Environmental Education connects learning in the classroom to life outside the classroom. Environmental Education works through a whole school approach. It utilizes and connects with the whole school community- students, teachers, parents, religious leaders and community members. Students are actively encouraged to see their community as a learning resource, to learn for example about environmental changes over time, to learn about traditions and customs and to explore local knowledge of food plants, medicinal plants, climate and wildlife.

Fourthly, schools can act as a spring board for positive change in the community. Through introducing students to new ideas, it is possible to influence families and communities. A good example would be the introduction of fuel efficient stoves in Timor-Leste. When students are learning about energy, they could trial current methods of cooking, the fuel efficient stove, and some alternatives such as solar cookers. They could consider and document the benefits and consequences of each cooking method. This practical trial would prove a powerful motivator for families to take up the use of the fuel efficient stove.

3

Educational Context

The situation facing the new nation of Timor-Leste at independence was extremely challenging. Like other systems within the country, education faced a myriad of challenging issues. The infrastructure of schools was largely destroyed and teachers left the country in large numbers to return to Indonesia.

In the very short time since independence, the situation has improved dramatically. There is now a basic infrastructure of schools across the country -

- i. **227 Basic Schools** which provide education for the three cycles (Grade 1 to 9);
- ii. **629 Primary Schools**, which provide education for first and second cycles only (Grades 1 to 6);
- iii. **355 Filial Schools**, which provide education for the first Cycle only (Grade 1 to 4). These Filial schools are often located in distant or remote locations and are directly associated with the closest primary or basic school.
National Education Strategic Plan 2011-2030 2nd Draft, 2011.

A teaching workforce has also been mobilized to staff these schools. This workforce has come from a variety of backgrounds and education levels.

It includes:

- Teachers who were trained and employed during the Indonesian occupation
- Teachers who were recruited at Independence for their Portuguese language skills – these teachers come from a variety of backgrounds and educational levels
- Teachers who have been trained since Independence and who have joined the workforce after pre-service training.

The infrastructure of schools was largely destroyed and teachers left the country in large numbers to return to Indonesia.

Portuguese has been established as the main medium for education with Tetum as the other official language. English will be introduced as the first foreign language.

Teacher Guides which include the curriculum and delivery strategies have been prepared for Grades 1-6. Text books with accompanying Teacher Books have been developed for most subjects with those for Tetum, Physical Education, Health and Hygiene and Arts and Culture in development at this time.

A project is underway to develop curriculum for the Third Cycle of Basic Education (Years 7-9). Curriculum Frameworks have been developed for the following subjects :

- Citizenship, civic education and human rights
- Life and work skills
- History and geography
- Natural and physical sciences

Once the Curriculum development project is completed, the Second Cycle curriculum will be reviewed to ensure a smooth transition between the two Cycles.

Lafaek, a magazine format educational resource, was produced to help to bridge the gap until text books became available. The magazine was a bilingual production using 70% Tetum and 30% Portuguese in material relating to Grades 1-2, 50% Tetum and 50% Portuguese in material relating to Grades 3-4, and 30% Tetum and 70% Portuguese in materials relating to Grade 5 and beyond.

It was closely linked to the curriculum and a version for Grades 1-3, Lafaek Kik, was also produced. Lafaek was an initiative of Care Timor-Leste but has now been transitioned to the Ministry of Education. Lafaek as a children's magazine will be discontinued and a new Lafaek community magazine will be produced.

School enrolments for Grades 1-6 have improved with the Net Enrolment Ratio by 24% from 0.67 to 0.83.¹

Despite this improvement, there are still significant problems with student drop-out rates across Basic Education. The Net Enrolment Ratio drops dramatically from 0.83 in Grades 1-6 to 0.25 in Grades 7-9. Although student retention is better in Grades 1-6 there is a large drop-out during the first two years of schooling. The number of children who enroll in Grade 6 is approximately 33% of the number of children entering Grade 1 (National Education Strategic Plan 2011-2030 2nd Draft).

The Ministry of Education has developed a comprehensive and visionary Strategic Plan (National Education Strategic Plan 2011-2030 2nd Draft) to lead the next cycle in the development of the education system. The vision for the Plan is:

"In 2025 the population of Timor-Leste will be educated, knowledgeable and qualified to live a long and productive life, respectful of peace, family and positive traditional values. All individuals will have the same opportunities to access to a quality education that will allow them to participate in the economical, social and political development process, ensuring social equity and national unity."

One of the priority areas for the plan is improving Basic Education (Grades 1-9). To achieve this improvement work will be focussed in four areas:

- Access and Enrolment
- Ensuring Teaching Quality
- Quality, Relevant and National Curriculum
- School Management

The Plan provides a well thought through approach to the development of the education system, and it will not doubt result in considerable improvement in both the short and long term.

1. Number of students who are at the formal age for a specific educational level and represented as a percentage of the total population in the same age.

4

Findings and Recommendations

The RAP consisted of two main activities. The first was research in the schools where interviews, focus groups and activities were undertaken with School Directors, teachers and students. The second was an analysis of curriculum and text books.

The team found a number of capacity constraints facing schools visited which will be addressed through the implementation of the 3 phases of the proposed program.

Finding from the schools

In undertaking the RAP the team found areas of strength within the schools, and areas in which schools need to be strengthened. In working to implement Environmental Education, Live & Learn uses a strengths-based approach in which the motivation and skills for positive changes are developed from the existing strengths, both within schools and within the education system more generally.

Strengths

- 1. The Ministry of Education is committed to positive change in Basic Education through improvements in school infrastructure, access and equity, teacher quality, curriculum and school management.**

The Strategic Plan is an optimistic and forward-looking document which gives school communities reason to be optimistic for the future. The team found a number of capacity constraints facing schools visited which will be addressed through the implementation of the 3 phases of the proposed program. These were:

- › *Most schools have large classes and crowded classrooms.*

One School Director reported that some classes have as many as 70 students. According to the Director, children were sharing desks. In the

school in Dili, teachers reported that some children have to stand in class because of a lack of chairs. This problem is not evident in the very small country schools.

› *Multi-age classes present challenges for teachers and students.*

Even the small sample of students interviewed clearly indicated the problem of over-age enrolment. In one school, the sample group of seven students from Grade 6 had an age range from eleven to fifteen.

› *Most school compounds are not secured.*

With the exception of Daisoli School, which has received assistance as a Child-Friendly school, compounds were not fenced. Animals wander through the school compounds with resulting health issues. Anyone can enter the school grounds at any time. This was given as a reason why school gardens would not work. The areas for outdoor activities are not inviting to students or teachers, although in the schools outside Dili, staff had planted some flowers. This was limited by the need to plant high up in pots where animals such as pigs and goats could not reach.

› *Only one school we visited (Daisoli) had functioning toilets with water for handwashing. Even this school reported having difficulty with long term water supply. (This school has received assistance through the UNICEF Child Friendly Schools Program)*

› *Schools did not have a staff room where teachers could prepare, mark, or store any materials.*

This does not support a culture in which the teachers' roles extend beyond the classroom. It does not encourage collaboration between teachers.

› *Schools have limited supplementary learning resources.*

All the schools visited had a resource room where text books are kept. There are some literacy and numeracy resources supplied through the Fast Track Initiative. All schools had a model of the human body. Some schools had maps and a globe but not all. No schools had a library or any resource centre which students could use. In one case, teachers

encouraged students to use a local resource centre run by an NGO.

2. Despite very challenging circumstances, schools are functioning in a professional way. All schools visited had hard working School Directors and teachers, timetables for classes, text books for most subjects, basic school room furniture and some learning resources.

Although much remains to be done in education, it represents a considerable achievement to have a functioning school system so soon after Independence. All School Directors spoken to had plans for the future, some more developed than others. One of the schools visited had even developed its own Strategic Plan which outlined practical steps for improvement.

3. Plans are in place through the The National Education Strategic Plan 2011-2030, to improve the availability of text books and accompanying Teachers' Books.

The lack of text books for Physical Education, Health and Hygiene, Arts and Culture and Tetum is causing stress to the teachers spoken with. This is increasing their level of preparation and they are not always confident that what they are doing is in line with the curriculum. As text books and the accompanying Teachers' Books become available, the levels of stress being faced by teachers should be reduced. This will allow them to focus on other areas such as improving their teaching delivery.

4. Schools are making good progress in involving parents.

All schools visited have a Parents' Committee. Representative on these committees had been selected by the parents. The Parents' Committee helps with practical tasks, for example in one school the Parents' Committee had organized the building of a kitchen for the School Feeding Program. In another they had been involved in fencing of the compound. This involvement of parents lays the groundwork for a 'whole school' approach to Environmental Education. The involvement of parents can be extended into further improving the school environment. They can also act as a learning resource for students and can contribute to initiatives such as a school garden.



5. Teachers are enthusiastic about improving their teaching and would like further training in student-centred teaching methods.

Teachers have three blocks of three weeks of in-service training each year. Teachers said they have not had in-service training dealing with student centred methodologies to date, nor have they had training to improve their teaching of Estudo Do Meio. They said most of their in-service training has been concentrated on Portuguese language. They are enthusiastic about improving their teaching methodology.

6. Teachers were aware of environmental problems such as landslides being caused by cutting down trees. While they did not appear to have a systems view of the environment, they did identify local problems and are interested in ways to improve the environment.

Teachers identified landslides and deforestation as problems and drew a connection between them. They are clearly concerned about these issues and are interested in possible solutions. In discussion however they did not appear to have an understanding of the concept of interdependence, with the exception of one teacher at the school in Dili. They also mentioned climate change however they appeared to have had limited exposure to information on the topic. They did not appear to distinguish climate from weather, and did not demonstrate an awareness of climate cycles or

patterns in climate. One teacher asked the question whether climate change is caused by man or by god. They were keen to discuss environmental issues and want to improve their knowledge in the area.

7. Teachers believe it is important that students learn about the environment and how to protect it. They are keen to learn more about the environment and to improve how they teach environmental topics in Estudo Do Meio.

These attitudes on the part of teachers are critical to the success of Environmental Education. It shows their commitment to a sustainable future, and to improving their teaching so that they are better able to develop knowledge, skills, attitudes and motivation for sustainability in their students.

8. Considerable investment is being made to improve teacher quality through in-service training.

Teachers attend three sessions of three weeks in-service training per year. Teachers interviewed reported that most of their training to date has focused on Portuguese Language. This is not surprising given that it is the teaching medium and that many teachers are not presently fluent in the language. The established structure for in-service training does present an ideal opportunity to improve the teaching of Environmental Education. In-service training focused on teaching Estudo Do

Meio using student centered learning methodology could make a considerable contribution to improving the delivery of that subject and to improving teaching more generally.

9. The students enjoy active learning but report they do not presently do such activities in class.

An activity undertaken with the students highlighted their ability to work cooperatively in a group, and their ability to actively discuss the exercise. They said they don't do this kind of group work in their classes however they would like to.

10. Students have a basic knowledge of species and they are interested to know more about what exists in their local area.

Students enjoyed looking at pictures of animals, birds, reptiles, fish and coral. They could identify these broad groupings however they did not know the names of local fauna. They were keen to discuss animals, birds and especially snakes they had seen. This interest to better understand their local world provides an important starting point for Environmental Education. This interest can be developed and extended through age appropriate activities. Some strengthening in learning resources is also required.

11. Students have some knowledge of health and hygiene which can be built on.

When the students were shown a picture of handwashing, children immediately recognized the activity. When asked when they should wash their



hands, they all said "before eating." Even when prompted, they were not able to come up with other times when hands should be washed. Not all students recognized dirty water. They simply said it was water. They did know when prompted that drinking dirty water could make you sick. The project being mobilized by UNICEF on health and hygiene should greatly assist in addressing problems in this area.

Areas for development

1. Teachers are struggling with the implementation of student-centred learning and need support to move to a more active and engaging style of teaching.

As an example, teachers were given a set of cards which could be used with groups in a wide variety of ways, for example to teach classification, to develop food webs, to build ecology maps. When asked how they would use them, all teachers interviewed said they would use the pictures to help in explaining topics. They could not come up with other ways to use the pictures.

Teachers interviewed in Grades 4-6 use limited group work. Where they do put students into groups, they ask the group to go through the text book and then a representative of each group explains what they have read. This was confirmed by students, teachers and directors. In three of the schools visited, the classroom furniture was single desks with detached chairs. This furniture can readily be arranged for group work however all classrooms in the schools visited were arranged with desks in rows facing the teacher.

Teachers are not utilizing the outdoor environment in their teaching. Teachers mentioned some outdoor activities however this was for celebrations, or for activities such as cleaning up the school grounds. They did mention showing parts of plants to students by using real plants; however they reported that they do not take the students on excursions to the local beach, forest or river. Nor did they facilitate learning activities such as mapping, observation, or games inside the school compound.

Most of the teachers interviewed are not conducting experiments and activities, even when

they are in the Estudo Do Meio text book. They report that it is too difficult, and there is nowhere to leave materials. They just explain the topic from the book. This was confirmed in our discussions with students.

Teachers require additional training which will allow them to experience learner-centred methodologies, and will assist them first to present structured activities, and then to develop their own activities. They need to develop an understanding of enquiry based learning, problem solving, risk assessment, and futures thinking. They need time and support to experience and implement a more action oriented approach to teaching about issues of sustainability.

2. Teachers need help to strengthen their own knowledge base regarding environmental issues and to move their own thinking to a more systems based approach.

Although teachers could certainly identify environmental problems, their knowledge was not extensive. In discussion however they did not appear to have an understanding of the concept of interdependence, with the exception of one teacher at the school in Dili. They also mentioned climate change however they appeared to have had limited exposure to information on the topic. They did not appear to distinguish climate from weather, and did not demonstrate an awareness of climate cycles or patterns in climate. One teacher asked the question whether climate change is caused by man or by god.

Teachers did not report connecting the topics they were teaching to the life world of the students. In one case, a teacher explained that there was

no need to visit the local community because students 'already knew all about that', and they are in school to learn something different. Again this demonstrates the need for further development in their understanding of environmental issues and the interdependence of human and natural systems.

Strengthening of the teachers' knowledge base can be done through in-service training as well as through the development of resource materials which support the teaching of environmental education.

3. The effectiveness of in-service training could be enhanced by using an extended model of training.

Teachers reported that it is not easy to apply what they have learned during in-service training. The in-service environment is different from the classroom and the learning is not always easy to apply in a different environment. Several different explanations were put forward for this. One Director said it is because teachers see further training as something for themselves personally rather than for the school. Teachers themselves said that it is because of lack of time and resources.

It is likely that greater effectiveness could be achieved if an extended model of in-service was adopted. The suggested model for improving teaching of Estudo Do Meio is a three stage model.

The model involves teachers in first extending their knowledge and skills, then in trying to apply what they have learned, and finally in reflecting on, and learning from, their experiences.

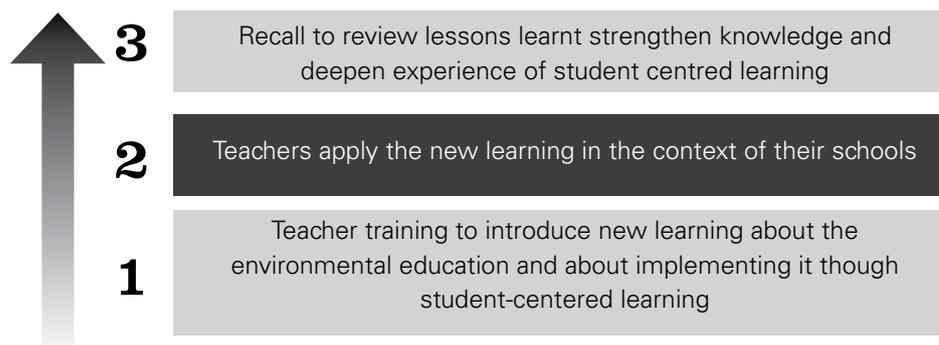


Diagram 1: Three stage 'sandwich model' for in-service training

Findings from the Curriculum Analysis

Given the limited time available for research, a decision was made to focus on a detailed review of the curriculum for Grades 4-6 and to concentrate effort on a review of the curriculum for those years for Estudo Do Meio.

In the curriculum at Grades 1-3, the emphasis is on the development of fundamental skills - reading, writing, numeracy and language development. There certainly are environmental topics covered and work could usefully be done in a more thorough mapping of this level of curriculum; in the first instance however the judgment of the team was that effort was more usefully concentrated at the Grade 4-6 level where students are forming more complex concepts, and dealing with a greater range of information. Ideally Environmental Education should start from Grade 1 and continue at a minimum throughout Basic Education from Years 1-9.

The brief from UNICEF was to focus on elementary school education which is undertaken in the first two cycles of Basic Education (Years 1-4 and Years 5-6). School attendance drops dramatically at the end of Year 6 and it makes good sense to concentrate initial effort at the earlier years. The curriculum framework for the third cycle (Years 7-9) has been developed and work is being done on the next stages of full resource development. It is recommended that consideration be given to extending the project to the third cycle of Basic Education. It may be possible at this stage to extend the curriculum coverage and the text book development to ensure that Environmental Education is embedded throughout Years 7-9.

Finally, the decision was made to focus detailed work on the curriculum for Estudo Do Meio. This subject covers history, geography and introductory science. It has a good coverage of environmental topics and provides a logical entry point to working with Environmental Education. A brief review was made of the curricula for Physical Education, Health and Hygiene and for Arts and Culture. In the case of health and hygiene UNICEF has a project focussed on this area and any work on Environmental Education should be done in close collaboration with this project. Arts and Culture offers some opportunities to connect through the coverage of traditional forms of art, drama and literature. It is likely that Tetum language may also provide some curriculum links with Environmental

Education. Text books are not yet available for these subjects so it is not yet possible to see how curriculum concepts will be actualized.

The curriculum (including text books and accompanying teachers' books) was examined in three ways.

- i. The content was mapped to show the extent of coverage of environmental topics.
- ii. The curriculum was considered in relation to a Best Practice model for the teaching of environmental education. The model used in this case was the Australian Sustainability Curriculum Framework, 2010. This recently published Framework represents a synthesis of international best practice. To illustrate the analysis, a mapping of a single topic which is taught at Grades 4-6 against the best practice model is provided in Annex 2b.
- iii. The curriculum coverage was considered in relation to major environmental challenges facing Timor-Leste.

See Annex 2 for details of the Curriculum Mapping.

Estudo Do Meio Grades 4-6

1. The Estudo Do Meio curriculum for Grades 4-6 does touch on a range of environmental topics.

2. The approach to environmental topics is not systems based and does not show the interconnectedness of natural and human systems.

Both the curriculum and text books are topic based. They deal with a good range of topics but don't make the connections with whole ecosystems, or the connections between human and natural systems. A good example would be mangroves which are mentioned as part of the topic dealing with forms of forest. Their role in the health of marine environments is not dealt with, and nor is their role as sites for fish breeding which links to local economies and sustainability of coastal communities.

3. Sustainability is not an underpinning theme in the treatment of environmental topics.

4. The presentation of environmental topics is

knowledge based. It does not connect well to the real life of students and it does not deal with student's values about and attitudes to the environment.

The Teachers' Book which accompanies the text book does suggest that students should do some listing activities, for example listing plants found in their local area. This activity is relatively passive, it is not supported by sufficient information to allow the students to meaningfully engage in identifying plants, and developing lists as an activity is repeated in many sections of the book. As a single activity it is fine but it is not adequate when it is the only activity.

5. It does not encourage students to take action that will help them, their families and their communities to live more sustainably.

The curriculum mapping against best practice highlights that the curriculum does not have any dimension of engaging students in taking action for sustainability.

6. The domains of competency in the curriculum do support group work and enquiry learning however this is not translated effectively into the text books.

The text books do not pose problems for students to investigate or solve. They do not provide a range of group work activities for students to undertake. Teachers need additional materials that support them in delivering student-centred learning.

7. Given the limited educational background of many teachers, the information on environmental topics contained in the Teachers' Book which accompanies the text book is not sufficient to enable teachers to adequately present these topics.

In order to teach effectively, teachers need to be well informed on environmental topics. Materials need to be developed to assist teachers understand the environment in a more complex and interdependent way. Teachers who are better informed are more confident in their teaching and are better able to develop student-centred activities.

8. There are a number of environmental problems facing Timor-Leste which are not covered in the curriculum.

Some topics may be covered in Grades 7-9 however the mapping (Annex 2c) shows that in Grades 4-6, many topics of critical environmental concern in Timor-Leste are not covered. Given the spiral nature of the curriculum, it might be expected that a range of these topics would be introduced at Grades 4-6 and then dealt with in more depth in Grades 7-9. This provides further evidence of the fact that sustainability is not an underpinning theme in the curriculum.

Recommendations

1. A program of in-service teacher training should be run to improve the teaching of Environmental Education in Estudo Do Meio, particularly at the Grades 4-6 level.

MoE as well as School Directors and teachers themselves identified a need for training to improve the teaching of Estudo Do Meio generally, and to improve the teaching of Environmental Education within that subject. The training should cover both pedagogy and content and should have a strong emphasis on allowing teachers to experience student-centred learning for themselves.

Ideally the in-service training should be run using a 'sandwich' model. The first part of the training would be a 3 day block of in-service to introduce the new support materials, to strengthen the knowledge base of the teachers and to allow teachers to experience student-centred learning for themselves. During this block of training, teachers would develop a plan of action for implementing improvements in their own teaching in their school. School Directors should be asked to support this commitment of the teachers. This block of practical experience together with trial and error, forms the middle part of the training. Next the teachers should be supported to apply new knowledge in their own schools keeping a professional development diary of their experience and then attend a further three day in-service block during which they discuss their experiences, work out ways to solve problems, and further strengthen their knowledge and experience of environmental issues and of student-centred learning. The fourth

and final block is a participatory writing workshop where teachers and school inspectors shape a new resource of student-centered environmental education materials that have strength through local ownership and relevance.

2. Teaching and learning resources should be developed to support the delivery of Environmental Education. In the first instance, the resources should focus on Estudo Do Meio in Grades 4-6. Some resources such as posters should also be developed to support the teaching of Physical Education, Health and Hygiene. Activities should be included which link to the Art and Culture and Tetum curricula.

It is not sufficient to simply provide in-service training. Teachers are struggling with their own knowledge levels as well as their limited repertoire of teaching strategies. They need a supported transition to student-centred Environmental Education. In the first instance, they need to have a resource of well structured activities with clear curriculum links. The activities need to be fully explained and the necessary underpinning knowledge for teachers needs to be provided. Asking teachers to move from their current level of knowledge and experience to developing their own student-centred activities is too big a step. Training on its own will not achieve the desired change. It needs to be supported with resources both for the teachers and for the students.

3. The Grade 4-6 resources should contain:

- Support materials for teachers
- A simple introduction to Environmental Education
- Background information for teachers which strengthens their understanding about the environment and enables them to see the interconnectedness of natural and human systems
- The resources should contain guides for running specific activities using the student learning materials, and also for activities which can be run using local resources
- A brief explanation of why these activities are important and how they connect to the curriculum
- Teaching tips on managing student-centred activities

- Practical strategies for initiating activities using the local environment and connecting with the local community.

Learning materials for students

- Pictures of Timor-Leste birds, animals, fish and insects, and plants
- Card sets which could be used in a variety of student-centred activities
- Posters
- Maps
- Stories
- Some simple teaching aids such as thermometers and a magnifying glass

4. Further detailed work will be needed in order to finalise the instructional design approach to these materials. One option which should be considered is to develop child centered self paced Learning Guides for students using a similar approach to the Escuela Nueva Foundation in Colombia.

These could be supported by a brief Teachers Guide which contains background information for teachers, an explanation of curriculum links and some teaching tips.

5. Materials should include both Portuguese and Tetum text.

Producing materials which have side-by-side text in both Portuguese and Tetum, will contribute to language development as well as ensuring usability.

6. Consideration should be given to extending the development of resources to cover Years 1-3 and Years 7-9 with a particular focus on Environmental Education in the Estudo Do Meio curriculum.

7. Consideration should be given to expanding the role of school inspectors to include supporting improvements in the teaching of Estudo Do Meio. Training should be provided for school inspectors in using the Environmental Education teaching and learning resources. In addition a DVD could be developed for their use which demonstrates some of the recommended activities.

A system of school inspectors has recently been introduced and the extent of their role is currently being clarified. An opportunity exists to utilize these professionals to provide school level mentoring and coaching. They could provide a vital link in ensuring that in-service training is used effectively at school level. School inspectors have been provided with a government issued laptop computer. This could be used to show short presentations of activities.

8. A resource should be produced to support the involvement of the Parents' Committees in improving the school environment.

Environmental Education works most effectively when the whole school community is involved. Parents and members of the community should not only be involved in practical maintenance and construction, they should also be taking steps to make the school into a model of sustainability for the community. This involves parents and community members in developing their own knowledge and skills as well as contributing knowledge and skills to the education of their children.

Because of literacy issues for parents in some schools, the materials should be provided in the first instance as a resource for the School Director to use in working with the Parents' Committee. The resource could include information on health and sanitation, water management including water harvesting, options for developing and maintaining school toilets, and ways of securing school compounds. Information on school gardens, how to establish them, and their educational value should also be included. The resource should encourage the Parents' Committee to take a lead in the process of developing a sustainable schools.

9. All project work should be done in close collaboration with the Ministry of Education

The MoE should, as a minimum, be involved in the design, review and approval of resources and training. Collaborative work should be done on the design of materials and training involving project staff and MoE staff. Draft materials should be actively reviewed by the MoE with the support of project staff as well as being trialed in-country. Ideally, if resources permit, a full collaborative development model should be considered. This would involve co-development of resources and development and delivery of training with MoE



staff and project staff. This would assist in building the capacity of the MoE in learning resource development and in the design and delivery of training. This issue is further explored in the next chapter on Project Design for Environmental Education Initiative in Basic Education in Timor-Leste.

10. The establishment of school gardens should be actively encouraged.

School gardens provide many educational opportunities. Many disciplines including Estudo Do Meio, languages, mathematics, and Art and Culture could utilize a school garden as part of their program for learning. Children can also learn the vital skills of sustainable agriculture, and experience how eco-systems work in practice. FAO has a school gardens project which aims to develop approximately one hundred school gardens by the end on 2012. Clearly there needs to be close cooperation between this project and any Environmental Education initiatives.

11. Further work should be undertaken to ensure that Environmental Education initiatives do not duplicate but rather capitalise on work already done by UNICEF and other UN agencies, National Institute for Teacher Training, NGOs and the Ministry of Education. Close and co-operative relationships with other agencies in the field of education should be fostered throughout the project.

12. In the longer term, as the Basic Education curriculum is reviewed and new curriculum and learning resources are developed, Environmental Education should be fully integrated, with sustainability as an underpinning theme across all grades in Basic Education.



5

Project Design

Capacity Building for Student Centered Learning through Environmental Education

Introduction

Environmental education is a lifelong learning process that leads to an informed and involved citizenry having the creative problem solving skills, scientific and social literacy, and commitment to engage in responsible individual and cooperative actions. These actions will help ensure an environmentally sound and economically prosperous future. Student centered environmental education has the potential to serve as a tool for building stronger bridges between schools and communities.

Solving environmental problems and preventing new ones from arising will require an understanding and appreciation of the linkages between environmental well-being and human well-being. However, many of these linkages are not apparent at the first instance. Based on the finding from the recently conducted Rapid Assessment of Perceptions (RAP), Live & Learn Environmental Education (Live & Learn) proposes a staged, versatile and student centered environmental education program, which seeks to build capacity to deliver sustainable learning outcomes for children in Timor-Leste.

Live & Learn has worked with UNICEF across the Asia/Pacific, in the Maldives, Cambodia, Eritrea, Fiji, Solomon Islands and Vanuatu, for the past 10 years. The focus of our partnership has been on developing and testing education methodologies to strengthen the confidence and positive assertiveness of children, starting within the formal education system and spreading to the community more broadly. Lessons learnt from this existing partnership will benefit this Program and will together with strong local participation and direction deliver visible results through three phases described overleaf.

The Program will seek to build education capacity for student centered learning using environmental education as an entry point.

Program design

The Program will seek to build education capacity for student centered learning using environmental education as an entry point. The interlinked phases are proposed to meet three objectives:

(Objective 1): Develop environmental education resources that are locally relevant and reflects the capacity and aspirations of the East Timorese people;

(Objective 2): Foster increased quality of teaching environmental education through provision of professional development;

(Objective 3): Facilitate opportunities for students to develop, test and apply new ideas and new knowledge.

Capacity building is the key aims across all three objectives. Capacity building activities includes stakeholders and systems at all levels and such activities will be based on Strength Based Approaches (SBA) working through the positive and resourcefulness aspects of the East Timorese society and culture. The three phases below are interlinked and costs are estimated separately in the budget enclosed with this document.

Phase 1: Development of learning resources (8 months)

Stage 1 will focus on the development of an Environmental Education Teacher's Manual and a few basic student-centered resources such as posters, picture cards and ecology charts. These resources will be developed by a full time Live & Learn education officer based in Dili and a reference group within the Ministry of Education and its partners. The development will acknowledge that to date educational resources have been developed with limited input from local education counterparts and this has impacted on local ownership and teacher's ability to use the resources. Resources are developed ad hoc with little testing and modification to local context and this limit quality and application.

Live & Learn proposes a different model, which will focus on strengthening local capacity in resources development and involve teachers, curriculum developers, school inspectors and school directors in the process. Such participation will be secured through reference groups and resources testing to ensure relevance of resources and to ensure teachers will use them and that they are in line with their skills and perceptions.

The resources will be based on local culture and context and the content will enable students to relate and comprehend. This test will give stakeholder an opportunity to comment and review the resources and ensure local ownership and participation. All resources will be complimentary to the national curriculum and will sit within national education priorities. All principles expressed through the manual will be strengths based and aim to build student's practical skills and confidence in areas key to prosperity and well-being.

The learning resource will tailored for grade 4-6 and be tested for impact before translated and finalized. The thematic content of the manual will be guided by the national curriculum and will be developed in close consultation with the Ministry of Education and local teachers.

Phase 2: Capacity Building and Training (18 months)

Based on the resources developed in Phase 1 a comprehensive capacity building program will be developed targeting teachers, school inspectors, school directors and curriculum staff.

The capacity building program has 4 blocks:

Each of the blocks would be conducted during the breaks between terms when teacher training is usually carried out. This will ensure that teaching time is not lost as a result of the capacity building program.

1. **“Learning Together” Block I** – an initial 3-day workshop where the content, background thinking and teaching and learning strategies that are used in this collection of teaching Modules from stage 1 will be introduced.
2. **“Learning Away” Block II** – participants return to their schools to implement one of the Modules in their teaching. During this period they will be asked to keep a professional practice journal of their experiences.
3. **“Learning Together” Block III** – a further 3-day workshop where participants can share their teaching practice with each other and consolidate on the experience of using a Module.
4. **“Action Based Environmental Education” Block IV** – a further 3 day writing workshop where teachers, school inspectors, school directors, parents and curriculum staff (from first three blocks) writes an Environment Education Activity Manual for children with support from Live & Learn staff. This block was acknowledged as a key activity to environmental education in Timor-Leste where many resources are written abroad and then introduced with limited impact due to lack of local participation and ownership. The resources will be tested before released for mainstreaming into the formal education system.

A series of 10 workshops (above model) will be delivered targeting a total of 200 teachers, 20 school inspectors, 100 school directors and 10 curriculum developers.

Phase 3: Action and Leadership (18 months)

Awareness and knowledge alone will not create the change needed for children in Timor-Leste to actively participate in environmental education. Often children receive information on issues relating to various development issues but have no opportunity to apply their skills once back in the community. This activity will provide practical means for children to apply their skills and take action on issues of concern. Rote learning remains one of the biggest constraints to building the capacity and engagement of children. In rote learning, children commit information to memory so thoroughly that they can recall facts almost instantly when given the right stimulus cue (like an exam), whether or not they understand them, or can process, apply or extend them.

Phase 3 will provide small grants for schools to pilot and implement environmental projects and activities described in the Environment Education Activity Manual from Phase 2. A series 30 grants with a value up to US\$ 5,000 will be granted for grassroots activities that will enhance:

- Analysis and exploration on environmental issues;
- Implement environmental project at school level;
- Link action in schools to action in communities
- Generating alternative paths and decisions on issues relating to the environment;
- Searching out the history of why something is the way it is;
- Revising opinions in the light of evidence;
- Understanding positive and negative instances and their role in drawing conclusions;
- Making comparisons and associations;
- Constructing and argument or arguing a point;
- Pushing ideas to a logical limit and testing them.

Working through an extensive sustainable schools network is key to the success of the action as schools often provide a safe environment to children. The role of teachers in enhancing the skills and confidence of children is critical. Therefore the action will work with teachers in empowering children to take the lead in achieving their goals. During a sustained leadership and action-based campaign, leadership capacities will be enhanced, starting from the school-based and shift to communities a community level.

Implementation principles

The effectiveness of this Program will depend on the strength and inclusiveness of the partnerships, networks and alliances which it is able to develop, among stakeholders at all levels. Something as broad-based and as long-term as Environmental Education can derive its energy and effectiveness only from partnerships and cooperative relationships – it is too great and too complex an undertaking for any one institution – local, national or international – to promote on its own. From the outset, therefore, the orientation of partners must be outward-looking, seeking to make connections with initiatives particularly the national curriculum and national education plans. The Program must identify and build on existing work and projects, building synergy and cooperation between them. A key aspect of partnerships and networking will be the regular and systematic exchange of experience and information and embed this in national priorities and grassroots innovation. This should an essential feature of the coordination of the Program phases. Links to international groups is also important as knowing what others are doing around the world is a significant source of learning and innovation, and frequently an encouragement and motivational force to persevere in the long term.

Based on the above the three phases will implemented using a series of eight implementation principles as displayed below:

- Build on strengths of existing systems, curriculum and education structures to advance environmental education
- Promote an inclusive society through inclusive, equitable implementation;
- Build up the relationship between children and the world around them
- Deliver visible results, in the short and medium term;
- Avoid over engineering, set realistic timeframes, ensure predictability;
- Develop and promote programmatic approaches and ensure activity is fully embedded in national education priorities;
- Promote mutual accountability, disciplined and responsible partners;
- Promote coordination and harmonisation.

Monitoring and evaluation

As part of start up activities the Program will put in place adequate processes of monitoring and evaluation from the start. Without that, it will be impossible to know if the Program is making any difference and what that difference is. A key aspect of monitoring and evaluation will be the identification of suitable, relevant and measurable indicators at every level – local and national – and for each phase of the Program. The results of monitoring and evaluation will be used for the assessment and reorientation of approaches and priorities, in order to ensure ongoing relevance and effectiveness. Qualitative and quantitative evaluation methods will be necessary to track the Program – aspects such as the adoption of values and changes in behavior cannot be adequately captured by numbers alone. A few preliminary performance indicators are displayed in Annex 1.0

Monitoring and Performance Indicators

Performance Indicator	Benefits
Stage 1: Development of learning resources	
Environmental Education Teachers Manual	1000
Ecology Charts and picture cards	1000
4 x Environmental Posters	(4x) 1000
Stage 2: Capacity Building and Training	
Teachers trained	200
School Inspectors Training	20
School Director	100
Curriculum Developers	10
Stage 3: Action and Leadership	
Schools involved in Sustainable Schools Network	100
Students benefiting from networks	>30000
Number of grants disbursed	>30



6

Annexes

Annex 1. Profiles of participating schools

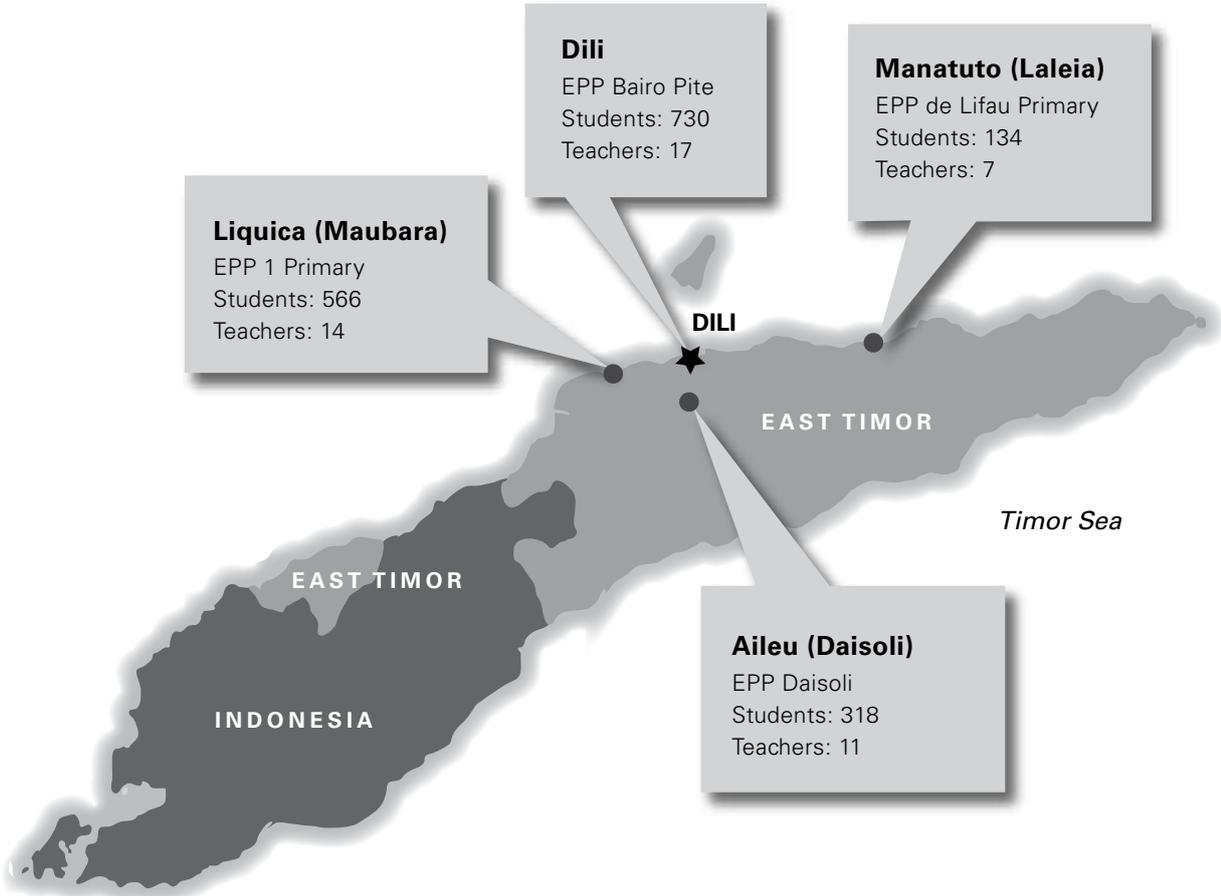
Annex 2. Curriculum matrices

- a. Coverage of environmental topics in Estudo Do Meio Grades 4-6
- b. Single topic mapping against Best Practice Model
- c. Coverage of critical environmental issues in Estudo Do Meio Grades 4-6

Annex 3. RAP activities

Annex 4. Resources consulted

Annex 1: Profiles of participating schools



Participating school profiles

EPP 1 Mabaura-Vaviquinia School is in the district of Liquica. It is a small school in a coastal community with 568 students and 14 teachers.

EPP Daisoli School in the district of Aileu. It is a small school in the mountains near Dili. It has received funding through UNICEF Child Friendly Schools program. It has 318 students and has 11 teachers.

EPP de Lifau School is in Laleia in the district of Manatuto. It is a small coastal school with 134 students and 7 teachers.

EPP Bairo Pite is in Dili. It is a large school with 730 students and 17 teachers.

Annex 2a: Curriculum matrices

Coverage of environmental topics in Estudo Do Meio Grades 4-6

Estudo Do Meio: The world around us				
Topic	Contents	Grade 4	Grade 5	Grade 6
Myself and others	Personal identity	•	•	•
	Me and my Family	•	•	•
	Locating myself in time	•	•	•
	The body	•	•	•
Myself and the community	The school	•	•	•
	Members of the community	•		
	Local institutions and services	•		
	Community history	•	•	•
	Local economical activities		•	•
Myself and country	Costumes, traditions and symbols	•		
	National institutions and services	•	•	
	The country's past/history		•	•
	National economic activities			•
	Timor-Leste in the world			•
Myself and the natural environment	Physical aspects	•		
	The Fauna	•	•	•
	The Flora	•	•	•
	The Earth		•	•
	The solar system		•	•

Physical education health & hygiene				
Topic	Contents	Grade 4	Grade 5	Grade 6
Physical movement				
Athleticism				
Health and hygiene		•	•	•

Annex 2b: Curriculum matrices

Single topic mapping against Best Practice Model

This matrix shows a single topic “Flora” which is taught at Grades 4-6 in the Estudo Do Meio Curriculum. The topic is mapped against an internationally recognised Best Practice Sustainability Curriculum Framework.

Mapping against Best Practice	
Single topic analysis: Flora Grades 4-6	
Best Practice Sustainability Curriculum Framework Level 3-6	Timor-Leste Estudo Do Meio, Grades 4-6
<p>Sustainability Action Process</p> <ul style="list-style-type: none"> • Making a case for change – exploring a sustainability issue relating to family school or community eg improving productivity of food crops • Defining the scope of the action – exploring options, negotiating agreement and identifying resources and constraints • Developing a proposal for action – preparing and communicating the proposal, getting agreement and support • Implementing the proposal • Evaluating and reflecting 	
<p>Knowledge of Ecological and Human systems</p> <p>Life cycles of fungi and plants, their needs, health and growth</p> <ul style="list-style-type: none"> • Photosynthesis and respiration • Sub-systems that enable life and reproduction in living things • Life cycles of common/local species • How humans care for plants <p>Food chains and food webs</p> <p>Adaptations, roles and relationships between fungi, plants and animals and their physical environment Human management of different ecosystems (historical and cultural contexts) Ways of caring for and describing ecosystems at different times of the year</p>	<p>Grade 4</p> <p>Brief overview, mentions soil and climate, where the forest regions are located due to climate and impact of humans. Typical types of forest and their characteristics-mangrove, coastal forest, mixed primary forest, highland forests. Revision exercise</p> <p>Grade 5/6</p> <p>Overview about why plants are important – oxygen, food for herbivores, which in turn serve as food for carnivores.</p> <p>Parts of Plants – roots, stem, leaves, flowers and fruit and their types functions.</p> <p>Needs of plants – experiments to show nutritional needs, method of absorbing nutrients, need for water, need for light, how they breathe.</p> <p>Paragraph on plants of Timor-Leste, lists plants with economic importance to Timor-Leste.</p> <p>Activity – organize a plant collection, write labels for all the plants with classification information</p> <p>Teachers guide – gather examples of plants to analyse</p> <p>Brief suggestions about a school garden</p>

Table continued ...

Best Practice Sustainability Curriculum Framework Level 3-6	Timor-Leste Estudo Do Meio, Grades 4-6
<p>Knowledge of Ecological and Human systems (continued)</p> <p>Change in living systems</p> <p>Techniques for investigating, assessing and describing physical environments Ways of monitoring trends in the health of eco-systems and reasons for change in eco-system health</p> <p>Agriculture and Food</p> <p>Large and small scale agriculture Sustainability issues in relation to food production Sustainable agriculture</p>	<p>Types of agriculture, main crops of Timor-Leste, where crops are produced, why crops are cultivated in a particular area, for example rice in areas of high rainfall.</p> <p>Classify – name of crop, tools used for cultivation, planting method, when it is harvested, tools used for harvesting, care needed during the growing period.</p> <p>Activity – find out what is the most common agricultural product in your area, in what season are they grown, list other crops grown in your area.</p> <p>Chain – wheat becomes flour, flour becomes bread.</p> <ul style="list-style-type: none"> • Forestry in Timor-Leste- names of tree species in Timor-Leste, their link to climatic zones. • Example of burning and exploitation of sandal forest and its consequences • Fruit trees –brief information, link to oxygen and soil erosion • Exercise – name the common trees in your area, what are they used for, do they exist in any other district, why is vegetation important.

Best Practice Sustainability Curriculum Framework Level 3-6

Timor-Leste Estudo Do Meio, Grades 4-6

Repertoires of Practice

Domains of Competence

World viewing

- Reflecting on, understanding, negotiating and changing beliefs, values and perceptions

Systems Thinking

- Taking the big picture
- Understanding interdependencies, tracking change over time
- Assessing probability, risk and benefit
- Identifying intended and unintended consequences

Futures and Design Thinking

- Envisioning futures
- Creating solutions
- Managing change

Acquire information

- Read
- Find information in books
- Consult and use maps
- Consult and interpret diagrams and graphs

Investigate

- Observe
- Inquire
- Describe
- Formulate questions
- Enunciate hypotheses and predictions
- Define objectives
- Verify hypotheses and predictions

Co-operate

- Work in groups
- Share responsibilities
- Participate in group discussion
- Formulate opinions and listen to the opinions of others
- Evaluate work done as a participant

Plan and evaluate

- Participate in defining the objectives and tasks needed to carry out a project
- Participate in evaluating the tasks, components and results of a project
- Participate in producing information
- Produce reports
- Produce a journal or information sheet
- Produce albums
- Organise an exhibition
- Explain information
- Participate in debates

Annex 2c: Curriculum matrices

Coverage of critical environmental issues in Estudo Do Meio Grades 4-6

Environmental status	Current curriculum coverage
Land degradation, deforestation, landslides, unsustainable farming, slash & burn	Briefly
Pollution: waterways, sea, air, land	Minimal
Waste management – sewerage, dumping, waste disposal, bury / burn, disease, rodents, and mosquitoes. Decomposition of waste	Nil
National parks of Timor, protected areas	Nil
Environmental laws; e.g. what is illegal logging?	Nil
Endangered, threatened, extinct animals of Timor-Leste	Nil
Energy sources: renewable, non- renewable	Nil (some on petrol)
Mangroves: logging, pollution	Briefly mentioned as a forest form
Agriculture, fisheries – rural economy	Yes
Erosion: soil quality, beach erosion	Yes
Coastal health: mangroves, coral, threats to mangroves, and logging, coral systems.	Mangroves only mentioned as a forest form
Unsustainable resources use: alternative livelihoods. Forest management	Nil
Biodiversity – importance	Minimal
Ecosystems: different types of forests, landscapes in Timor-Leste. How this supports biodiversity, interdependence.	Some mention of forest types, but no mention of the interdependence of nature.
Climate: weather	Yes, but not connected to local climate issues
Climate change: adaptation to this	Yes but not connected to local climate issues
Threats to the environment	Yes, landslides, natural disasters covered
School health: fencing, ensuring a clean school environment, ensuring student access to toilets, access to school water supply. School gardens.	TBC, little evidence of school gardens.
Native animals / plants of Timor- Leste. Introduced species	Some but mostly reference to domestic animals.
Sanitation and hygiene	Yes, in PE, health subject. Nothing on open defecation or how to ensure your water is safe to drink
Water quality: watershed	Yes
Medicinal plants and non-timber forest products	Nil
Humans in the environment – people and their needs integrated into systems, a balance between sustainable use and conservation	Nil

Annex 3: RAP Activities in Schools

School Directors: 4 (1 female and 3 male)

Teachers: 17 teachers (8 female, 9 male)

Students: 26 students (12 female, 14 male)

Data Collection Tool	Method	Purpose
Semi-structured interview with each School Director	The research team identified a number of broad focus areas for discussion. Open questions were used to explore these broad areas. The School Director was encouraged to raise issues and to move beyond the areas identified by the team.	To gain an understanding of the operation of the school, key challenges for the school, to explore perceptions regarding environmental issues, to explore understanding of environmental education, to explore pedagogical issues, to gather information about the involvement of parents in the school
Focus group with teachers	This was a facilitated participative discussion. The research team raised a number of issues for discussion and the teachers were also able to raise issues.	To gain an understanding of teachers' perceptions of environmental issues, of successes and challenges in their teaching, of their views about how teaching of environmental education could be improved.
Teacher activity using picture cards	Teachers were invited to look at a random selection of picture cards. The cards included pictures of birds, animals, fish, garbage, plants, hand washing, local markets, land slips, wood cutting. Teachers were invited to discuss ways in which they could use these cards in lessons from the Estudo Do Meio curriculum.	This is another way of gaining insight into the ways in which teachers are currently teaching environmental topics, their capacity to innovate, and their views on environmental issues.
Student activity using individual picture cards	Children were shown cards and asked to tell us anything they knew, or thought about the pictures. Students were encouraged to discuss the pictures and to tell us whatever they wanted – stories, facts, ideas.	To gain an insight into children's understanding of environmental issues and attitudes, to gauge the level of their knowledge and complexity of their thinking, to prompt discussion.
Student classification activity using picture card set	Cards were put out randomly and students were asked to work together to separate the cards into Living and Non-living things. They were encouraged to discuss the activity in as a group.	This activity gives an insight into students capacity to work in groups cooperatively, into their knowledge level on environmental issues, their conceptual development. It also prompts lively discussion in which children raise a variety of issues.

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