

Namib Desert Environmental Education Trust NaDEET

Evaluation

Environmental Education to Empower Namibian Communities to Improve their Living Conditions

Final Report

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Submitted by:

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Unfortunately due to budget constraints, we were not able to see all beneficiaries of this project. We hope that there are many more Environmental Champions who will be further inspired to take action.

Auriol Ashby

Jennifer Van Wyk

Cover Photo: Learners from Oan//ob Primary School demonstrating how to use a solar cooker at NaDEET.

Acronyms

DRFN	The Desert Research Foundation of Namibia
EE	Environmental Education
EEIS	Environmental Education and Information Services
EU	European Union
ICT	Information Communication Technologies
MET	Ministries of Environment & Tourism
MoE	Ministry of Education
NaDEET	The Namib Desert Environmental Education Trust
PS	Primary School
PoN	Polytechnic of Namibia
SS	Secondary School
SLTs	Sustainable Living Technologies
SWOT	Strengths, Weaknesses, Opportunities and Threats
UNAM	University of Namibia
WAD	Women Action for Development

Executive Summary

Ashby Associates cc conducted this external, end-of-project evaluation of NaDEET's three year EU-funded programme: "Environmental Education to Empower Namibian Communities to Improve their Living Conditions". The main purpose of the evaluation is to track the impact of the programme on individuals, families and communities and progress in its six results areas.

A NaDEET Centre school programme was observed for one day, focus group discussions were held with 154 learners and key informant interviews were held with 13 NaDEET staff, 11 teachers and 8 community members in 8 communities in Hardap Region. In addition, NaDEET's M&E systems, standard operating procedures and reports were reviewed. We are confident that this qualitative study captures an accurate picture of the project's many achievements and does not shy from detailing areas which can be strengthened.

Environmental Education targeting Schools in Hardap

Over the project period, the NaDEET Centre provided a holistic, four day environmental education experience, which is experiential and outdoor in a desert environment, to 33 upper primary and secondary school groups, reaching 866 learners and 57 teachers. Its curriculum is relevant to many school subjects and with the Ministry of Environment and Tourism's environmental education aims.

Effective learning has taken place as children (and teachers) met during the review were able to give examples of NaDEET's four focus areas – energy, water, waste and biodiversity. It was clear that participants who attended the NaDEET Centre remain conscious of not wasting water and energy and not littering. Some transferred their knowledge to other learners and family members but there was little evidence of further environmental action; only a few "environmental champions" did more. Further action is limited as primary school children have little influence over household resources and are reliant on adults to organise further school-based activities. By contrast, the Grade 9 "Environmental Champions" at Anna Maasdorp school made and distributed 50 fuel efficient stoves, made 100 firebricks and organised a recycling day involving a local lodge and the village council.

Targeting adult community members

Six communities in Hardap Region attended a practical training at the Centre which aimed to equip households with knowledge and skills to live more sustainably. The 128 participants (70% women) were given intensive lessons in cooking using sustainable living technologies (SLTs) in particular a parabolic solar cooker, solar oven and fuel efficient stove using handmade firebricks from waste paper. NaDEET took a shortened version of the programme and gave intensive workshops in cooking using SLTs in various communities in Hardap and Kavango Regions which reached 255 participants. Through both these actions, a total of 327 SLTs were earned, made or won and dispersed to participants.

From the feedback of only 8 community members we met, the retention of environmental messages which demonstrated improved ethic and environmental knowledge were less prominent than the enthusiasm for the SLTs. The adoption of SLTs has varied and no one uses them exclusively, except the wind guard to protect open fires. There is no doubt that SLTs are relevant, appropriate and effective as the majority of households still use firewood for cooking and heating water.

The Transport Fund enabled 16 school, community and educator groups to travel to NaDEET, valued at N\$114,454.50. During the second year, the Ministry of Education's Hardap Region Directorate announced that it would fund the transport of schools which indicates it highly valued the education experience provided by NaDEET and allowed more funds to be allocated to SLTs and outreach activities.

Targeting Educators

NaDEET exposed 73 educators, tertiary students from the Polytechnic and community trainers on three courses at the Centre during the project period. The six NaDEET interns, who worked at the centre for 6 months each, actively participated in all aspects of the Centre's activities notably outdoor teaching, programme and activity planning and assisting with the Centre's logistics. The experience provided them with hands on EE experience and broad, valuable workplace skills. We know the other activities took place but the result requires data which reflects the quality of the educators' performance before and after the 4 day course, which we do not have.

Environmental Literature

NaDEET has published 6 editions of The Bush Telegraph and has distributed 18,000 copies of each to individuals, schools and other environmental education centres. Feedback gathered shows there is an insatiable demand for literature of all kinds in schools. Both adults and children described, with smiles, how they enjoy reading the Bush Telegraph. The children liked the variety, the content and the pictures. Some of the teachers reported using it in class.

The learning pack "It's Time to Grow" is praised by teachers of young children and it now needs to be more widely disseminated.

Conclusions

The verbal feedback from children and adults show that NaDEET's strategy of mixing practice with theory is an effective and powerful environmental education learning strategy that has enabled both children and adults to retain desirable environmental ethics and knowledge for several years. We agree with one teacher who felt these are such powerful experiences that they will be retained for a lifetime and are likely to be passed on to their children.

The evidence shows that NaDEET has achieved Results 1-3: Improved environmental ethics, knowledge and skills for environmental action taking; and increased access and ownership of environmental education opportunities and sustainable living technologies, especially for the most vulnerable groups.

Through the production and widespread distribution of the Bush Telegraph and the development of the learning pack "It's Time to Grow, NaDEET has achieved Result 5: increased access and use of locally based, relevant environmental literature for Namibians, especially for children, educators and community members.

The only evidence we have seen for Result 4 (Enhanced implementation and teaching of sustainable living by educators and tertiary level students in various learning settings) has been the six NaDEET interns, who are employed by the MET and NaDEET, applying what they have learned.

Apart from the reduction in its own enviro-footprint, there is little evidence that NaDEET has made a significant impact in achieving the very ambitious Result 6: Better protected local environment (especially water and energy resources) and improved quality of life. Poor

households are less wasteful of resources and have relatively small enviro-footprints. Most participants do not have the financial means and access to resources to adopt some of the technologies, but they say they know how and do what they can. There was some adoption of SLTs by community members (no data is available to quantify this) which would reduce CO₂ emissions. In the feedback sessions, it was clear that participants who attended the NaDEET Centre remain conscious of not wasting water and energy and not littering.

As staff at NaDEET realise, they have sown some seeds and created some awareness but NaDEET has many years to go before the project will make a significant impact towards the overall objectives of raising living conditions whilst protecting the environment. The project is relevant to all target groups and the environmental education methods are very effective and efficiently carried out.

NaDEET was able to manage the increased demands in programme management which came with the EU funding because of its competent management which had already put many systems in place. Its shift of emphasis towards training and providing sustainable living technologies has diverted considerable human resource energy away from EE. With the pressure to pass on skills to enable people to adopt SLTs during outreach, there is a risk of losing the important wider environmental messages which can best be achieved through its environmental centre, which should be replicated.

Recommendations

1. NaDEET should encourage schools to bring learners to NaDEET who are not in their final year to enable the school to foster and benefit from further environmental learning and action.
2. NaDEET should review and further differentiate the NaDEET syllabus between primary and secondary schools and increase the environmental science project content for better resourced schools - the urban primary and secondary schools.
3. NaDEET should identify keen learners, teachers and community activists and enable and support them to become Environmental Champions for sustained action.
4. NaDEET should consider replicating its centre in other regions to enable more learners and communities to benefit from this successful holistic environmental experience.
5. NaDEET should target vulnerable communities in informal and urban settlements which are more likely to adopt new ideas, have greater access to materials for recycling and are easier for NaDEET to support.
6. NaDEET should encourage schools to send their school maintenance person and/or cook(s) to the NaDEET outreach points and Centre programme.
7. NaDEET should foster greater links and partnerships with COSDECs, KAYEC, Bicycle Empowerment Namibia, WAD and SMEs which could be trained to make and support sustainable living technologies for sale around the country.
8. NaDEET should demonstrate fuel efficient stands for large pots (used still in Uibis) to the national organisers of the MoE School Feeding Programme so they can order and distribute again to all schools which use wood.
9. NaDEET should hold a week at NaDEET targeting only Environmental Champions and then plan how to actively follow-up with community and school champions.

10. NaDEET could explore producing a newspaper supplement as an alternative or in addition to the Bush Telegraph (like Abacus of the early 1990s and recent educational booklets produced by the Legal Assistance Centre).
11. NaDEET should critically review the many Centre tasks to reduce or streamline those which are too time-consuming.
12. The EU should allow NaDEET to overhaul and revise the logframe for the new EU project to make the objectives and results SMART, which will lead to manageable and measurable indicators.
13. NaDEET should explore the use of new ICT as learning tools and to make its M&E systems more efficient.
14. NaDEET should translate the Pre and Post surveys into Afrikaans for community groups and primary schools.
15. NaDEET could monitor website hits and Bush Telegraph downloads as a measure of their reach.

1 Background

In October 2013, *Ashby Associates cc* conducted this external evaluation of The Namib Desert Environmental Education Trust (NaDEET) programme: Environmental Education to Empower Namibian Communities to Improve their Living Conditions. NaDEET is a Non-Governmental Organisation based on the Namib Rand Nature Reserve whose mission is to protect the natural environment of Namibia by educating its citizens to practice a sustainable lifestyle.

The Terms of Reference are attached in **Appendix 1**. The main purpose of the evaluation is to track the impact of NaDEET's programmes on individuals, families, communities and the environment on a long-term scale towards making Namibian society more equitable and sustainable. The focus is on the components of NaDEET's work that are funded by the EU for the three year period January 2011 – December 2013 for €203,850, which:

- a. Run the NaDEET Centre programmes which were annually attended by 8-9 groups of school children totalling 350, 2 groups of 20-30 community members and 1 group of 20-30 educators and on which 2 Polytechnic of Namibia and UNAM interns worked for 6 months per year.
- b. Conduct at least one community and school outreach per year
- c. Distribute sustainable living technologies to the communities including approximately 60 solar cookers, 6 solar ovens, 120 fuel efficient stoves, recycled paper bricks, bucket showers and solar lamps.
- d. Produce Environmental Literacy: 6 Bush Telegraph magazines and 1 Sustainable living booklet- "It's Time to Grow".

The evaluation will use NaDEET's logical framework to assess its progress towards the expected results and meeting its specific objective using the given indicators (**Appendix 2**). The programme's six expected results are:

- 1) Improved environmental ethic among Namibians
- 2) Improved knowledge and skills for environmental action taking
- 3) Increased access and ownership of environmental education opportunities and sustainable living technologies, especially for the most vulnerable groups
- 4) Enhanced implementation and teaching of sustainable living by educators and tertiary level students in various learning settings (i.e. schools, community programmes, environmental education centres).
- 5) Increased access and use of locally based, relevant environmental literature for Namibians, especially for children, educators and community members.
- 6) Better protected local environment (especially water and energy resources) and improved quality of life.

The evaluation considered its findings and assessed the impact, relevance, appropriateness, effectiveness, efficiency and sustainability of the action.

2 Approach and Methodology

After discussions with NaDEET's Director, Viktoria Keding, *Ashby Associates cc* used a combination of observation, focus group discussions and key informant interviews to gather field data. The evaluation was conducted by Auriol Ashby and Jennifer Van Wyk who spent two days at the NaDEET Centre interviewing staff and volunteers, facilitating a Strengths, Weaknesses, Opportunities and Threats (SWOT) Analysis with them, observing, and interacting with the school group, Oan//ob Primary School, which was attending for that week. The schools and communities were purposely selected, based on schools and communities where NaDEET had not done any follow up, where they were unsure or under the impression that there was little impact and/or where other evaluators had not visited. The following schools and communities in Hardap Region were visited:

- Edward Frederick Primary School (P.S.), Uibis and two community groups
- Jacob Soul P.S., Stampriet and community members
- Witkrans PS, 20km South of Stampriet
- Anna Maasdorp Combined School, Duineveld
- Mariental Secondary School (SS)
- Origo P.S., Rehoboth and community members
- Witkop P.S., 70km South West of Rehoboth
- Maltahöhe community members.

Table 1 shows that the views of 154 learners were gathered through 8 focus groups and 11 NaDEET staff and volunteers, 15 teachers and 9 community members were interviewed. A focus group discussion was held with a further 17 community members at Uibis to act as a control group to test the relevance of the programme as they had had no contact with NaDEET. **Appendix 3** lists all the people met during the evaluation.

Table 1. Total number of learners met in focus groups

School	Place	# Learners	# Girls	# Boys
Anna Maasdorp	Duineveld	27	7	20
E. Fredericks	Uibis	10	7	3
Jackob Soul PS	Stampriet	27	10	17
Mariental SS	Mariental	40	20	20
Origo PS	Rehoboth	19	12	7
Witkop PS	Witkop	19	10	9
Witkrans PS	Witkrans	12	4	8
Total		154	70	84

Most of the focus groups were conducted in Afrikaans to enable learners to express themselves clearly. The focus group questionnaire is shown in **Appendix 4**.

FINDINGS and ASSESSMENT

3 Environmental Education targeting Schools

Relevant Results areas involving school children and teachers are:

Result 1: Improved environmental ethic among Namibians

Result 2: Improved knowledge and skills for environmental action taking.

Result 3: Increased access and ownership of environmental education opportunities and sustainable living technologies, especially for the most vulnerable groups.

3.1 Outreach tour to schools

At the beginning of the project in 2011 NaDEET conducted an Outreach Tour to 19 schools with approximately 790 learners and 5 village councils in the Hardap Region as only 14 of the region's 58 schools had visited NaDEET since its start in 2003. The Desert Research Foundation of Namibia's (DRFN) energy trailer was used to demonstrate solar energy and solar cooking and to show a DVD about NaDEET. The aim of the tour was to make each school aware of and understand the programme and to encourage all schools in the Hardap Region to attend its programme. The outreach tours also enabled NaDEET to publicise the EU Transport Fund which was available for any school in Hardap Region to experience a week at the centre. As some schools are quite small, NaDEET encouraged them to group with other local schools to bring all the upper grades as one group. This happened with Witkop PS, Tsumis Farm PS and Piet Diergaardt PS in 2013.

In 2012, the Outreach Tour reached about 780 participants including learners, teachers and school staff at seven primary schools. In 2013, the community outreach tours were done instead of school outreach as the purpose of the school outreach was achieved - all schools were aware and had been to the Centre or were going to the Centre that year. The Outreach Tours 2013 aimed to improve Result #3 specifically and are reported under Community Outreach. The impact of the tours is assessed under the evaluation sections 3.3 and 4.1.4.

3.2 The NaDEET Centre schools' programmes

The NaDEET approach is to provide a holistic, four day environmental education experience, which is experiential and outdoor in a desert environment, as the key to increasing awareness and knowledge as well as eco-friendly attitudes and skills. Over the project period with EU funding, the NaDEET Centre provided this experience to 33 school groups tailored for upper primary and secondary schools, Grade 6 – 10 (**Table 2**).

Table 2. Summary of schools attending NaDEET with EU funding

Type of school	# schools participating	Total # learners	Total # female learners	Total # male learners	Total # accompanying teachers / staff
Primary 2011	7	238	124	114	20
Primary 2012	10	302	172	130	24
Primary 2013	13	211	110	101	16
Total Primary	30	751	406	345	60
Secondary 2013	3	115	61	54	6
Grand Total	33	866	467	399	66

At the centre, learners and teachers are able to experience first-hand about sustainable living, biodiversity and the interrelationship between people and the environment. During the week, the children live in “sustainable living teams” of 8 people, which build teamwork and cooperation in an environmentally friendly way to save water, cook and conduct most of the activities at the centre. Within their groups they conduct environmental auditing, measure their daily enviro-footprint and record the daily weather using maximum and minimum thermometers. The four main components covered by all schools are:

- *Sustainable energy use and sustainable living technologies:* Five practical experiments are carried out in their teams covering conduction and insulation, the Greenhouse Effect, absorption and reflection, bundling, and waste energy. These solar energy concepts are then applied to practical sustainable living technologies for electricity and cooking. Each group has to cook (and clean up) for all the participants and educators, supervised by NaDEET staff who train them to use solar cookers, ovens and fuel-efficient stoves.
- *Sustainable Water use:* the water cycle, water saving experiments and the teams compete to minimise their daily consumption.
- *Exploring biodiversity:* a daytime dune walk, and night time catch and release trappings and scorpion hunt; exploring environmental problems, causes and impacts.
- *Waste Management:* “the three Rs” – Reuse, Recycle and Reduce. They learn how to make fire bricks from waste paper to replace firewood when cooking.



Photo 1. Oan//ob learners conducting experiments at the NaDEET centre



Photo 2. Oan//ob learners conducting experiments

Interwoven in those topics is how human activities cause environmental problems, such as unsustainable living practices, deforestation, pollution, climate change. By measuring their consumption of energy, water and waste generated, the participants can see their own impact on the environment. The Centre has been auditing its footprint as a whole for many years and demonstrates how it is minimising its impact.

In addition, participants are made aware of light pollution and learn some basic astronomy (Namib Rand Nature Reserve meets the Gold tier standard of the International Dark-Sky Association standards, the first in Africa and the first in any developing nation).

The secondary school programme adds more activities which require creative and critical thinking.



Photo 3. Gender norms are ignored

An important aspect of the programme at NaDEET is there are no gender roles for any age group. Men and women are expected to perform all tasks on an equal basis.

3.2.1 Collated Responses from focus groups with learners

The most common responses, with no mentionable difference between schools or ages, are listed below. Not all aspects were remembered immediately but as soon as learners started to talk, the rest followed.

1. When did you go to NaDEET?

- Between 2011-13
- Two of the girls went when they were in primary school and again when at Anna Maasdorp.
- Seven went in grade 7 and again when at Mariental SS.
They confirmed that the programme for primary schools had a different content to that for secondary schools and how the centre accommodation had much

approved. When they went a second time, they already knew the concepts that NaDEET promotes and it seemed to have reinforced their awareness.

2. What do you remember about NaDEET?

(indicates it was mentioned by all focus groups)*

- * Most remembered all four aspects – water, energy, waste and biodiversity - and were able to describe aspects of each element.
- * The dune walk - biodiversity – how animals survive in the desert; seeing the white dancing spider and Tok-tokkie beetle
- * The three Rs – recycling, re-use and reduce waste
- * The environment – deforestation, must plant trees, don't waste water, burning garbage causes air pollution.
- * Hotbox with newspaper in it, solar cookers, solar ovens
- * Star watching at night.
- * learning the scientific names of animals and plants
- * Preparing and cooking their own food
- Dune boarding

3. Is anything you learnt at NaDEET relevant to your school work?

- *“Yes, particularly Natural Science and Geography - we learnt about some of the practical experiments we did at NaDEET in our subjects.”*
- All learners confirmed that the NaDEET programme is relevant to their school subjects.
- Most learners said it provided additional information: e.g. although they were familiar with some animal (insect) and plant species, it was at NaDEET that they learnt the scientific names.
- Some learners reported that although they were familiar with some experiments (they knew the theory) it was only at NaDEET that they did it practically for themselves.

4. What type of energy do you use at home? (firewood, electricity, other?). Where do you get your water from?

- Most of the learners have electricity at home but still use firewood for cooking. Of those with electricity, most only use it for lights, and some have fridges and television.
- *“We collect fire wood three times a week and it takes about two hours. (Uibis)*
- Some buy wood at prices starting at N\$5, others collect wood which takes about an hour and a half.
- Some families have solar cookers; they use it and they do not collect so much wood. (Uibis)
- Some have flushing toilets; others still go outside – “use the bush”.

5. Did you apply anything you learnt at NaDEET – to your personal life, your family, your community or school environment?

- Although they still use firewood at home, they said the fires have a guard around them to protect from the wind.

- Told their family at home to recycle, use water carefully and about solar oven and cookers (Anna Maasdorp)
- “I wash less often – only once a day now” (several)
- Now use empty milk containers to drink water rather than from a running tap (Jacob Soul)
- Use an old tin, cup or carton to wash my teeth (many)
- Use cups and plastic bottles in the hostel (Anna Maasdorp)
- Three boys have gardens which they water from the dams and use compost which they learnt how to make at NaDEET, in small buckets (Anna Maasdorp)
- They are more aware of our natural resources and to use them sparingly (several).

6. What makes it difficult for you to implement NaDEET’s ideas?

All answers related to children not being able to source raw materials to make the fire bricks or fuel efficient stoves.

3.2.2 Case Studies of follow-up activities by learners

Anna Maasdorp Combined School, Duineveld

Duineveld is a community in the South of Namibia with a boarding school called Anna Maasdorp. The grade 10s visited NaDEET in June 2013 and they pledged to put what they had learnt into practice.

Keeping the environment clean

Upon their return from NaDEET a group of learners went to the local council’s office in Kalkrand. Their mission was to inform the council about the importance of keeping the environment clean; their attempt fell on deaf ears. Not to be discouraged by this, one of the boys then lobbied a family member who has a tender with Red Dune Lodge. They organized themselves with the assistance of one of their teachers to have a clean-up and recycling day in their village. Red Dunes Lodge provided drums to separate the recyclable materials, black plastic bags and refreshments. During the day they shared the importance of looking after the environment with the community. They shared information about fuel efficient stoves, solar cookers and how to make the fire bricks using the old newspapers. The village council was so impressed with their efforts that they now employ both in- and out-of-school youths to keep the town clean on a daily basis.

Reuse

- The group collected old used 20litre paint tins. Then they made fuel efficient stoves which they saw at NaDEET and they have since distributed more than 50 fuel efficient stoves in the community. When making the stoves they involved the grade 9s so they also learnt how to do it.

Recycle

- The group collected old newspapers, such as the free *Informante*, from the post office, added any scrap paper from the school and made 100 paper fire bricks for free distribution in the community.

Reduce

- The group visits the local dumpsite regularly to look for items that can be reused or recycled which subsequently reduced the amount of rubbish burnt.

Mariental Secondary School

An English teacher from the school grouped each of the students who went to NaDEET with four other grade 9 learners who did not go. The students had to reproduce the practical experiments that they did at NaDEET for those who had not attended. There is no better way to learn than to teach and the messages got transferred to even more learners.

Origo Primary School, Rehoboth

The students from this primary school organised a recycling day at their school, sponsored by G4S that donated three recycling bins to them.

They also made shields for their lamps in an effort to reduce light pollution.

3.2.3 Findings from Teachers

Sixteen teachers and principals from eight schools in Hardap Region were interviewed and asked what they remembered about their visit. Common responses were:

- to use waste materials, to recycle waste paper.
- The three Rs – reduce, recycle and reuse
- How to save energy. *“I learnt that the stand-by mode still uses power so we switch off our appliances and we have changed all our light bulbs. I am proud of that”.* (Mariental SS)
- Solar cooking
- How you can do almost everything with solar energy
- Sustainable living. *“I shower less often now -I used to shower three times a day”.*
- Recording their water consumption every day; how to use water wisely
- How to look after the environment
- The children enjoyed competing to save the most water, cooking by themselves and playing in the dunes
- *“Impressive: the structures, the rooms with nets, the clean, neat toilets and showers”.*
- *“I was sceptical about the solar cooking but it was so easy to manage; very sustainable; outstanding”.*
- *“The programme must go on. What the children learn there, they will never forget. They can teach their family and teach their children”.*

A teacher at Uibis uses the fuel efficient stove every morning even though he has electricity and this has reduced his firewood consumption. He reported that the learners had learnt a lot but they have not noticed a long-term change in behaviour. They could not make fire bricks as there is no source of waste paper in the small village. Although Witkrans PS is also remote and extremely poor, the teacher gathers newspapers and after 2-3 months he gives a pile to the learners to make fire bricks.

Comments from teachers on other learning experiences gained from NaDEET

- *“It is very appropriate to our curriculum. It is integrated with the school syllabus.”* Examples given were the desert features and measuring weather are part of social studies / physical geography; resources in Grade 8 Geography; ecosystems, energy and electricity in primary level science.
- *“It supplements the school curriculum so the school benefits”* (Witkrans).

- *“The learner-centred approach was very good. I learnt the power of visuals. I watched how Vilho identified the trouble makers quickly and handled them with patience”. (Mariental SS)*
- The Afrikaans teacher at Mariental SS put an essay question “What can we do to save our planet” in the grade 9 exam. All the learners who went to NaDEET answered well; the other learners chose other topics. (This highlights that sending the relevant subject teacher is not a critical issue as long as the person becomes motivated to follow-up).
- *“It is an opportunity for us to explore our own country; it opens our eyes.” (Witkrans).*
- *“The top twenty children in Grade 6 and 7 were selected to go to NaDEET as an incentive to work hard. Next time we should include the below average children too as there is lots for them too”.*
- *“Almost every rural house in north-central Namibia has a photovoltaic panel to run lights and some for a TV.” (Mariental teacher).*
- *“We can tell you that Marissa and Raina are the potential Environmental Champions among the learners” (Mariental SS).*
- The other teachers present in the Uibis interview were very keen to go to NaDEET.
- The teachers’ suggestions for follow-up actions which schools could do after the NaDEET visit included:
 - A talent show
 - The learners were pleased to receive the follow-up letter from NaDEET but if it was a book marker, they would see it more often.
 - *“We need ideas for science clubs, enviro clubs and projects for the Science Fair” (several).*

3.3 Evaluation of the Schools Programmes

From Pre-visit and Post-test questionnaires, NaDEET is able to track what learning has taken place. The percentage of learners who say they have learnt concrete skills during their visit are shown in

Figure 1:

Figure 1. Skills learnt by school children during the NaDEET programme

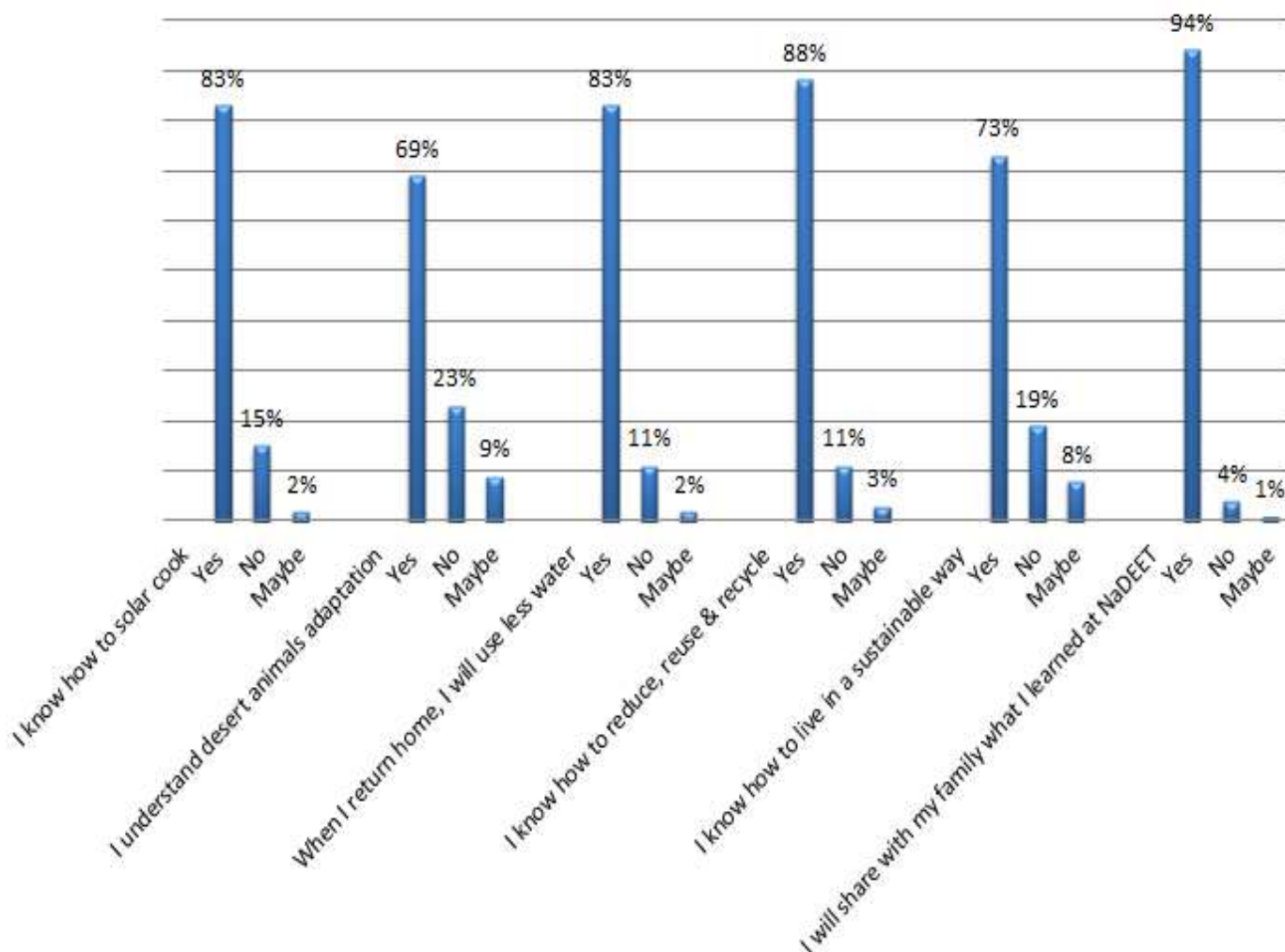


Figure 1 also shows that 94% of learners want to share their new knowledge when they get home. The high percentages reflect how NaDEET inspires environmental ethics and teaches skills for environmental action taking (project Result Areas 1 and 2).

Figures 2 and 3 compare pre and post visit views on one way that humans harm the environment. It shows a clear improvement in the understanding of how humans impact negatively on biodiversity. **Figure 3** does not capture the improved environmental language used by the learners to express these issues. (The high percentage of children not understanding the question is discussed under **Section 7.3** Monitoring).

Figure 2. Summary of Pre-visit response to one way humans harm the environment (EU-funded schools)

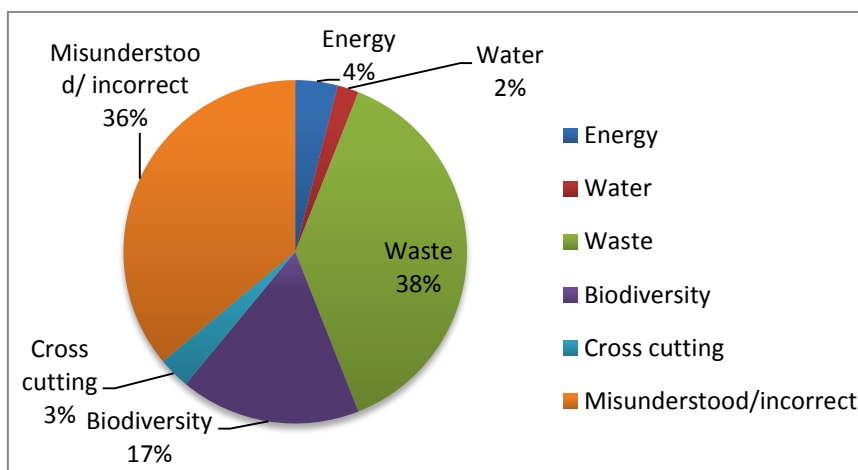
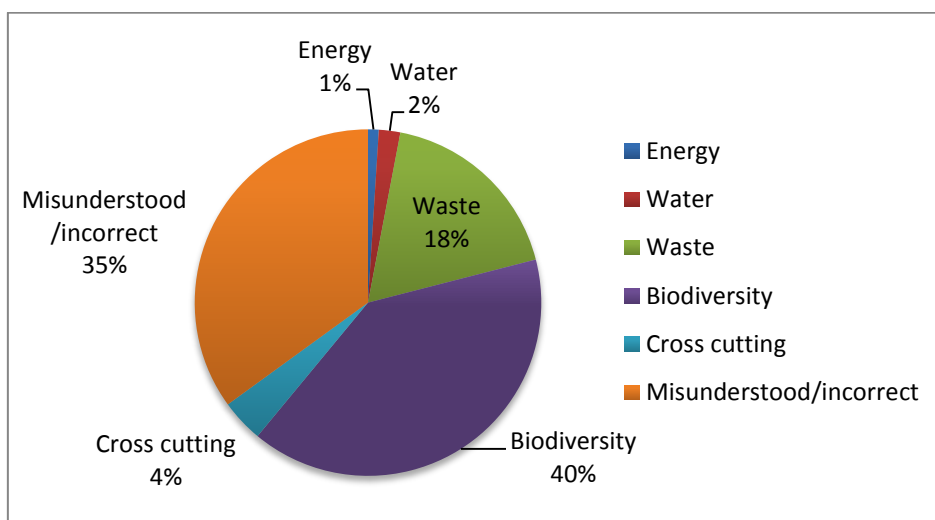


Figure 3. Summary of Post-test responses to one way that humans hurt the environment.



The children (and teachers) met during the review were able to give examples of NaDEET's four focus areas – energy, water, waste and biodiversity. It was clear that participants who attended the NaDEET Centre remain conscious of not wasting water and energy and not littering. Students from Oan//ob PS are encouraged to bring a plastic water bottle to school. Others use any other empty containers e.g. milk cartons and many said they use cups to brush their teeth not running taps.

Some learners have transferred their knowledge to other learners and family members who did not go to NaDEET but there was little evidence of further environmental action; only a few “environmental champions” did more.

Relevance

The aim of NaDEET's school programme is to give a good foundation in basic environmental principles and action taking. It aims to help learners identify environmental problems (especially in regards to energy, water, biodiversity and waste) and to gain knowledge, skills and the ability to take action to address these problems. This is in line with the vision of the Environmental Education and Information Services (EEIS) Unit in the

MET which “*envisions an environmentally aware and literate Namibian nation where environmental education forms an integral part of our everyday lives.*”

NaDEET is able to demonstrate how its learner-centred teaching methodologies and activities link with national policies such as Vision 2030 and Environmental legislation and complements the national education curricula for Upper Primary and Junior Secondary levels. It has shown how its four day programmes link with Maths, English Second Language, Geography, Life Science, Physical Science, Life Skills, Natural Science and Health Education, Basic Information Science, Social Studies, Elementary Agriculture, Design and Technology, Art and Home Economics (as illustrated in **Table 3**). It also provides opportunities for learners to develop critical core skills e.g. team work, problem solving.

Table 3. Two examples how NaDEET's programme links to national policies

NaDEET Programme		Links to Namibian National Curriculum		Links to Development & Environment	
Activity	Learning Objectives	Upper Primary Syllabuses	Core Skills	Vision 2030	Environmental Regulation
Waste Management - 3 Rs Game	To gain knowledge about improved waste management through the 3 Rs: recycling, reusing and reducing.	Design & Technology 10.1.3 English 2nd Language 10.1.1, 10.3.1, 10.4.1.1, 10.4.1.4 Natural Science & Health Ed 10.1.3, 10.1.5, 10.2.3, 10.2.10, 10.3.10	Personal Communication Social Learning to learn Cognitive	Educate all Namibians with respect to environmental & development issues and the total economic value of Namibia's natural resources (Ch 5, p 6)	Pollution Control and Waste Management Act
Waste Management - Making Recycled Fire Bricks	To gain skills and hands-on experience in recycling, reusing and reducing as means of improving our environment.	Design & Technology 10.1.3 English 2nd Language 10.1.1, 10.3.1, 10.4.1.1, 10.4.1.4 Natural Science & Health Ed 10.1.3, 10.1.5, 10.2.3, 10.2.10, 10.3.10	Personal Communication Social Learning to learn Cognitive		

NaDEET has developed an Upper Primary continuous assessment record which aims to empower teachers to utilise the learning at NaDEET Centre for their own syllabus requirements and gives the opportunity for the use of continuous assessment.

Appropriateness

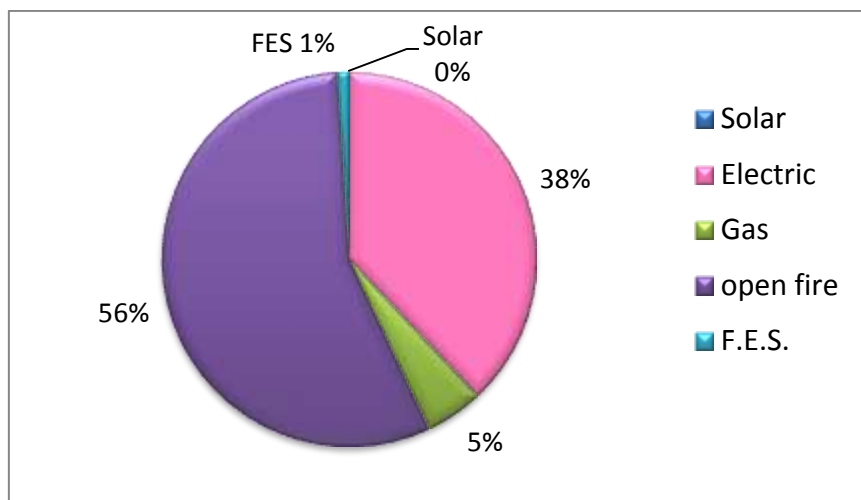
The relevance and appropriateness of the intervention to education was validated by the MoE Director for Hardap Region in June 2012 when the MoE pledged to provide transport (bus and fuel) for all schools from the region to attend NaDEET. (The savings from the EU budget line were allowed to be allocated elsewhere in the action, primarily community outreach for increased SLT ownership).

NaDEET has always maintained an open door policy which encourages all schools to attend the centre programme. During their outreach, NaDEET heard that some schools had not even considered attending as they were so poor. NaDEET was able to reassure them

that with the EU support for the course and its transport fund, every school in Hardap Region could attend.

Most households from the Hardap Region still use open fires (**Figure 4**) and the children often are responsible for collecting the firewood which takes them on average an hour and half. Any reduction in firewood consumption is therefore relevant to their lives and to reducing environmental degradation.

Figure 4. Method of cooking at learners' homes



In the teaching methodology, the NaDEET educators recognise the importance of using the pre-test to assess the home environment of the participants which guides them to pitch the activities to the appropriate level.

During the review, it was suggested that the teachers should be asked to describe the energy and water usage of their school feeding programme and hostel (number of children, type of pots, fuel source) so that NaDEET can encourage appropriate follow-up actions.

Effectiveness

From the responses gathered during interviews and focus groups, the holistic approach of the NaDEET programme is a very effective way to sensitise learners about environmental issues. The comparison of pre and post tests show learning took place; learners and teachers interviewed have retained environmental messages which some learnt months and even three years ago. They are aware of environmental sustainability issues and some try to practically apply what they have learnt at the centre in their everyday lives. The NaDEET experience gave learners a sense of independence and personal responsibility; they experienced great joy in being personally responsible for their meals and water use.

As children are not in charge of their households, they have no say in what type of energy is used in their households. Most households still use open fires to cook although the majority of learners from NaDEET say they now put wind shields around them. The children say they would prefer to make the fire bricks or use fuel efficient stoves, but finding materials is not easy (they are from some of the most disadvantaged and poor communities).

Some teachers felt that learners from better-off homes are more likely to continue using electricity and gas and less likely to adopt sustainable living technologies (SLTs). When responses to the Pre-tests are analysed further, NaDEET can show that learners from rural

schools and poor schools arrive with less concern for the environment and less understanding that their actions can make a difference to the environment. In the Post-tests, children from poorer schools are less likely to say “Yes” I know about desert adaptations (62% : 74%), the three Rs (74% : 89%), and how to live sustainably (56% : 74%) than those from better-off schools. However, interestingly, they were significantly more sure they will use less water (78% : 52%) when they return home. It is not clear how much this reflects their competence in grasping new concepts or their language skills but it shows how people from disadvantaged communities need more exposure to centres like NaDEET.

The Grade 9 and 10 learners have more control of their lives and were able to make more practical changes. As they are older, they do not require as much supervision; they are able to do a project with less assistance from a teacher or adult, making it easier to mobilise themselves. The group at Anna Maasdorp is an example where they organized themselves independently, organized a local event and made SLTs.

The principal of Oan//ob PS usually brings learners from Grade 7 in their last trimester at the school but this results in no potential for follow-up action at the school by the learners.

These examples show that effectiveness of NaDEET is influenced by background and age of participants. NaDEET has demonstrated its effectiveness in raising environmental awareness and skills among its participants. If a further desired outcome is to pass the knowledge and skills on to others, then targeting the older secondary school children would have greater effect.

Efficiency

Every moment of the four day course at NaDEET is carefully planned to give the participants environmental experiences and messages. With its emphasis on environmental sustainability as well as its aim to enable disadvantaged Namibians to attend the centre, NaDEET is able to keep its costs low; it provides full tuition, materials and a residential, full board course for N\$180/person/day, which is impressively efficient.

Sustainability

At the school and individual level, many of the activities which the school learners and teachers have seen could be expanded into Science Fair projects. Encouraging and facilitating this would be another way of sustaining interest and commitment to promoting environmental sustainability.

None of the participants or schools in the review had initiated an Enviro Club to continue and expand the ideas gained at NaDEET. Some learners in Anna Maasdorp were the most active in follow-up and the key “ingredient” seems to be one or two individuals who are “Environmental Champions”. NaDEET needs to identify, follow-up, support and promote such champions to sustain the action further.

At the implementation level, the contribution of the MoE to enable schools in the region to attend has reduced the cost to NaDEET and also impacts on the sustainability of the action.

Several learners and teachers recommended that NaDEET should set up centres in other regions to make the experience available and accessible to more schools throughout Namibia.

Challenges, Gaps and Opportunities

Adapting to different learners: The Pre-test survey enables the educator to assess the level of the participants. They quickly have to adapt their teaching style and content to suit their level. This is very challenging for inexperienced educators who need on-going mentoring.

NaDEET's follow-up with schools and teachers is a challenge as most schools do not have reliable internet and NaDEET's distant location makes physical follow-up expensive. NaDEET's six monthly magazines "The Bush Telegraph" already contain many ideas and linking this with the Namibian National Science Fair would provide ideas to extend the messages and learning opportunities. Encouraging the formation of Enviro Clubs in schools is an opportunity but the only school in the Region on the Bush Telegraph mailing which is recorded as having an Enviro Club is AA Denk Memorial School in Kalkrand. How can NaDEET encourage further action?

Unmotivated and/or overstretched teachers: NaDEET has no control which teachers volunteer or are sent to the centre; often it seems to be an inappropriate subject teacher but this evaluation has found that a language teacher can re-enforce environmental lessons learnt (e.g. through an exam essay question). This challenge clearly impacts on the likely responses to further follow-up. "*Teachers are overloaded with work and administration*" (a principal).

Targeting relevant MoE Advisory teachers: Hardap Region has one advisory teacher for moderating schools in Life Science, Science, Biology and Agriculture. She had not visited one of the primary schools in this review since 2011, which highlights the capacity of the ministry for follow-up.

Little control over waste: Village and town councils' waste collection is contracted out and only in Windhoek are items separated for recycling. Several learners and teachers commented how the school had separated their waste only to see the waste collector throwing it into one container.

Recommendations

1. NaDEET should encourage schools to bring learners to NaDEET who are not in their final year to enable the school to foster and benefit from further environmental learning and action.
2. NaDEET should review and further differentiate the NaDEET syllabus between primary and secondary schools and increase the environmental science project content for better resourced schools - the urban primary and secondary schools.
3. NaDEET should sponsor a Hardap Regional Science Fair prize for Environmental Education to encourage more follow up action.
4. NaDEET should identify keen learners, teachers and community activists and enable and support them to become Environmental Champions for sustained action.
5. NaDEET should consider replicating its centre in other regions to enable more learners and communities to benefit from this successful holistic environmental experience.

To increase the impact, NaDEET could:

- Provide follow-up ideas for Science/Enviro clubs.

- Give teachers' notes of experiments done, for them to replicate at school.
- Highlight that the directions for how to build most of the SLTs are in the booklet "It's Time to be Efficient" which is given to all schools for their resource centres. (Several teachers and community members asked for guidance notes to make a fuel efficient stove and bucket shower).
- Advertise Outreach Tours through the schools to enable parents to gain similar knowledge and skills.
- Convert the follow-up letter which NaDEET sends to each participant to a bookmark.

4 Targeting community members

Relevant Results areas involving community members are:

Result 1: Improved environmental ethic among Namibians

Result 2: Improved knowledge and skills for environmental action taking.

Result 3: Increased access and ownership of environmental education opportunities and sustainable living technologies, especially for the most vulnerable groups.

4.1.1 NaDEET Centre Programme

NaDEET reached its target to enable two groups of community members to attend the centre per year and exceeded the total target of 120 participants (**Table 4**).

Table 4. Summary of community members attending NaDEET

Type of Group	# organisations participating	Total # participants	Total # female participants	Total # male participants
Community 2011	2	40	30	10
Community 2012	2	29	15	14
Community 2013	2	59	44	15
Totals	6	128	89	39

The four day course is a practical training to equip households with knowledge and skills to live more sustainably. Participants are given intensive lessons in solar cooking, how to make a fuel efficient stove and they prepare their meals during the course using these technologies. The course includes some theory on environmental problems, climate change and compares the energy efficiency of various fuel sources and stoves.

In 2011, the community from Stampriet sent 20 mostly out-of-school youth which NaDEET felt was not successful as they did not show much interest. The uptake of solar cookers was average after the programme, but there was no follow up correspondence from original organisers within community. However, more than two years later, we met one participant, Jacques Coetzee, who proudly showed us his large solar cooker which he uses from 12.30am to about 3pm most days. His parents run a soup kitchen from their yard for the elderly and vulnerable children, 2-3 times per week when food is available. For such large an amount of food, the solar cooker is too small and they use a wood fire with a moveable

metal wind shield to cook a large potjie. He uses the fuel efficient stove in winter when the sun is too weak and when the electricity is off.

In 2012, community members from Maltahöhe (5), Uibis (15) and Klein Aub (9) attended the four day programme and on average 70% of them now own a solar cooker, earned through the voucher system (explained in the next section).

When asked what the community members remember about the course, they responded:

- The solar cooker
- Fuel efficient stove
- Fire bricks from newspaper
- Hot box
- *“I liked the NaDEET staff, Very friendly; nice people. They take time to explain to us.”*
- *“I like how the houses are in nature”*
- *“How they teach us to survive without electricity”.*

In 2013, Aranos and Rietoog communities attended the same programme but there was no budget to include them in the review.

4.1.2 Sustainable Living Technologies

NaDEET’s Result 3 is increased access and ownership of environmental education opportunities and sustainable living technologies, especially for the most vulnerable groups.

Fuel efficient stoves

NaDEET gets new 20 litre paint tins donated and teaches adult participants how to convert them into a fuel efficient stove for use with small pieces of wood or hand-made fire bricks made from waste paper. Fuel efficient stoves were popular with some as they are good for winter and early morning. Many users commented how they noticed how much less fuel they need to cook a pot of food using a stove compared with an open fire.



Photo 4. Examples of fuel efficient stoves

Fire bricks from waste paper

NaDEET has perfected a way of making fire bricks as an alternative fuel to wood. The waste paper is soaked in water and then re-constituted by hand into tennis-sized balls and dried. About 4 balls in a fuel efficient stove are sufficient to boil a pot of food for 20 minutes. *“I help the fire brick to light with a bit of paper”.* An early version of the firebricks was made in cement brick moulds until NaDEET learnt that people were not adopting the technology because they did not have access to the form.

Energy efficient fireplace



Photo 5. NaDEET's demonstration energy efficient fireplace

This concept which is demonstrated at NaDEET is possibly over-elaborate for easy adoption by most households. It is also too high for use by the large cooking pots used by many feeding schemes and families.

Solar cooker

The original, large solar cooker available at the beginning of the EU-funded programme cost N\$2,000 but in 2012, NaDEET sourced a cheaper, smaller version for N\$750 each. Instead of two participants having to share one cooker, the voucher system was introduced which has increased the number of solar cookers distributed.

After one house nearly caught on fire when a solar cooker was left pointing at it, NaDEET provides covers for all new solar cookers at no extra charge, and has to buy the material for a staff member to sew them. NaDEET now makes it a priority to warn all users about the danger and also how to avoid the bright reflections from sun causing potential damage to eyes.

The voucher system to earn credit towards a solar cooker

Each voucher is worth N\$250 so three are needed to receive a solar cooker worth N\$750. At NaDEET Centre each participant is given the opportunity to earn 3 vouchers and they must take 3 different tests. The tests are a written test with 10 questions, 1 general sustainable living practical test focussed on water and waste and 1 energy practical test focussed on the solar cooker, oven and FES. On outreach, NaDEET only allows each participant to earn one voucher to have the workshop learning time comparable. The outreach single voucher test had two parts: a written test with 6 questions and a practical test correctly using a solar cooker. Full marks are possible if the pot is set up on the cooker; the cooker is turned correctly to the right/left, moved up/down bringing the reflection on the right position. When done, the pot must be removed and the solar cooker turned away from the sun and covered. If one of those is not done a mark is deducted. To obtain one voucher, participants are only allowed to give one incorrect answer out of 10.

Participants who passed the test can either combine their vouchers with other participants or add cash to obtain a solar cooker. On outreach it is easier for family members to be trained and to earn three vouchers and one solar cooker per household.

Bucket Shower

Participants staying at NaDEET all experience how a metal bucket, fitted with a shower head, uses considerably less water than washing in a basin which is the most common method in Namibia.

Hot box

A hot box can be made from any insulating material and can prolong the cooking time without any additional fuel. The demonstration box at NaDEET is made of strong wooden planks and the boiling cooking pot is placed amongst the insulating fabric. It is very appropriate and practical for people who cook with electricity.

Solar Oven

In the early courses, community groups helped make a solar oven and it was raffled off at the end of the course to a lucky participant. This was stopped because very few participants had the skills to help build the oven and the course is not meant to teach carpentry skills. For cooking during the course, NaDEET uses two ovens: a very expensive, highly efficient solar oven which is too expensive to replicate and is therefore only for demonstration purposes and a locally made wooden oven that unfortunately does not have a good sales distribution, again making it inaccessible to most participants.

4.1.3 Community Outreach

The aims of the community outreach tours are to create awareness about NaDEET's programmes on environmental education and sustainable living to community members and to increase access, ownership and practices in sustainable living technologies. They were not part of the original planned action activities, but were possible due to extra funding from the underused transport fund and to reach more communities.

In April-May 2013, NaDEET held four workshops in Rehoboth, each of approximately 4-5 hours at three venues - Women Action for Development (WAD), Oan//ob Primary School and Orange Babies. All venues were chosen because the organisation had already participated in a NaDEET Centre programme and would be able to identify appropriate participants on NaDEET's behalf. The programme was similar to that offered at the NaDEET Centre i.e. introducing the concepts of sustainable living, energy, energy efficiency and teaching community members how to solar cook. **Table 5** shows that 115 people attended over the four days and they had an age range of 14 – 71 years, the average being 36 years; 24% were male.

Table 5. Details of participants attending the Rehoboth outreach tour in 2013

Place	Turnout	Number participants		Age (years)		
		Male	Female	Average	Oldest	Youngest
WAD	16	5	11	39	71	24
Oanob	14	3	11	33	56	16
Orange Babies	37	7	30	38	66	14
Orange Babies	48	13	35	36	66	15
Total	115	28	87	36.5		



Photo 6. Participants at the Rehoboth Outreach workshop

NaDEET changed their policy and allowed a few teenagers to participate so that a whole family could earn three vouchers to obtain one cooker; sharing a solar cooker between households has proved not so easy. A total of 27 solar cookers were distributed during the Rehoboth outreach through the voucher system.

Feedback from the Rehoboth outreach workshops is that 2 days is not really sufficient to learn all the skills. There are too many people for each one to get adequate attention and hands-on experience.

The second community outreach tour introduced NaDEET to the Kavango East Region for the first time.

NaDEET staff organised the Kavango East outreach with environmental education practitioners in the region from the Ministries of Environment & Tourism (MET) and the Youth National Service, Sports and Culture. Communities were notified by word of mouth and by local radio in good time as community members had to pre-register to ensure only the required number of people (21) attended. About 300 members of seven communities and nearly 1,000 learners at six schools were introduced to NaDEET and to the concepts of sustainability (**Table 6**). Materials such as the *Bush Telegraph*, *It's Time to Change*, *It's Time to Grow* and 'Are you living a low carbon lifestyle?' posters were distributed to the schools.

Table 6. Sites visited during the Kavango East Outreach Tour

Venue	School(s) visited
Ncumcara Forestry Office	Ncumcara Primary School
Ndonga Linena Village	Ndonga Linena Combined School
Shinyungwe Youth Centre	Shinyungwe Primary School
Frans Dimbare Rural Youth Centre	Dr Diescho PS & Kake PS
Kamutjonga Village	Kamutjonga PS
Mavandje Village	Mavandje PS
Rundu	No school visited

The Kavango outreach workshops were attended by 140 participants aged between 30 – 60 years of whom approximately two thirds were women and 87% were literate.

4.1.4 Evaluation of the community programme

Impact

During visits to various communities, we saw and heard of the adoption of several environmental lessons and use of sustainable living technologies (SLTs) learnt through NaDEET. Comments from participants attending NaDEET were similar to those given by the children and teachers above – they talked about the need to save water, reduce waste and the importance of looking after the environment. However, their replies focused far more on the sustainable living technologies:

- The Uibis community estimated that about 10 other community members have since made their own fuel efficient stove.
- Mr Fleermuis, from Uibis, was the only person who seemed to understand how the bucket shower could be made as he had some basic plumbing skills required to provide water for his livestock.
- In Maltahöhe, an old lady now collects old newspapers from the library and makes fire bricks. Another lady in Rehoboth sells fire bricks and took a fuel efficient stove to the north.
- *“I am a single mother with six boys. I showed them how to use the solar cooker. It means we have hot water to wash in”. I put it in a thermos for the morning too.*

Written results at the end of the Kavango Outreach workshops showed that community members had acquired environmental ethics and had gained practical knowledge and skills. Through the voucher system on that outreach tour, 48 solar cookers were earned and distributed to:

- 40 community members (one solar cooker/three people)
- 4 schools (Linus Shashipapo SS, Divundu CS, Dr J. Diescho PS and Kake PS)
- 1 Shinyungwe Youth Centre
- 2 conservancies (George Mukoya Conservancy and Mbambangandu Conservancy)
- 1 by Ministry of Environment and Tourism - Environmental Education

Relevance

To check the relevance of NaDEET’s programme, the evaluation team met with community members in Uibis, a very disadvantaged community of about 45 households with about 200 people (there are 120 learners at the primary school).



Photo 7. Focus group discussion with the community at Uibis

Having warmed the discussion up by asking about their livestock, which roam free and are un-herded, they were asked what their environmental concerns were:

- *Lack of sanitation* was their immediate response: “People have no toilets and use the bush”. “There are no toilets here”.
- *Water*: The community is already aware not to waste water which they use for cooking, body and clothes washing. They fetch their water, by hand or donkey, from a borehole and have to pay the shop owner a contribution for the diesel. At least 1-3 days per month he is away and during that period the village has no water, except from the river. The school pays for a security guard to prevent people from taking their water which is run on an electric pump. The availability of the diesel determines when they wash their clothes. The animals only source water from the (dry) riverbed. One person said that 20 litres of water lasts for two days, which is extremely low consumption.
- *Gathering wood*: It takes more than an hour to walk to fetch wood from the riverbed nowadays. If they buy firewood, it costs N\$50 per cart load of wood. The MET says they must get a permit to collect firewood and there is a penalty but no-one has been fined.
- *Electricity*: Although most households have electricity, they only used it for lights and radio which cost most people about N\$20/month; 3/17 people in the group had a fridge (the others keep food cool under the bed and one had a water-cooled closet). Pre-paid electricity had to be bought in Mariental, which costs N\$70 to reach or in Maltahöhe which costs N\$30 – N\$70 by “taxi”. A few years ago, NamPower did not reach Uibis to swap their incandescent lights bulbs with energy-saving, low wattage ones so they are unaware of the potential savings. They collect wood to save electricity. The biggest source of income in Uibis is pension money (N\$600/month) and child welfare grants.
- *Household waste* comprises of plastic, animal bones, glass and tins and is taken to a place outside the village and burned. They are worried about their livestock eating bags and young children who chew on the old bones.
- *The houses* are of low quality and they leak. Some people are members of the Shack Dwellers Association of Namibia which has a savings scheme. They contribute small amounts of money every month which they hope will eventually enable them to build a brick house.

When asked if they knew of NaDEET some said they had seen and were impressed by a solar cooker. They did not recognise our description of a fuel efficient stove.

The community has a Uibis Conservancy Committee and the game guards prevent people from killing the game. The community only benefits from the conservancy when old people receive 1,5kg of meat/household in December and some meat is available for sale in August.

Similarly, in Maltahöhe and Stampriet, most of the adults are pensioners and many houses have electricity which people use only for lights, and sometimes TVs and fridges. Even so, half the people cook with firewood which costs N\$110 per donkey load. In Stampriet, the deputy mayor told us that most people cook with firewood and there is a shortage and people have to pay N\$15 -25/bundle. Oan//ob PS reported it uses about N\$100/week of firewood.

So in conclusion, Uibis is similar to many communities in the south of Namibia and there is clearly an interest in the environment and a need for SLTs which must be very low cost and appropriate. Community members were keen to attend NaDEET.

Appropriateness and Effectiveness

Although SLTs can help vulnerable groups to reduce their daily living costs, they are more challenged to take advantage of NaDEET and to adopt SLTs. Several of the Uibis and Klein Aub community members failed to attend the NaDEET course as planned. Many of those who attended were not able to contribute financially to add to their SLT vouchers so only a few SLTs were taken back to the community. At Uibis, Stampriet, Wtikop and Witkrans, accessing waste paper is a problem so they cannot make the fire bricks.

Feedback from five Uibis participants said they had learnt how to cook using solar, to make fire bricks from waste paper and had each made a fuel efficient stove which they brought home with them.

“We can see the FES uses so much less wood”. “ We use old planks and even cow dung with it.”

“The solar oven was not taken on. The box is difficult to make – it needs glass, wood and a mirror”.

“The hot box is not being used as we cannot get the thick wood”.



Photo 8. High tech solar oven

Some of the technologies are too complicated, “high tech” to replicate and people think they have to be identical to the ones shown by NaDEET. NaDEET has already adapted the fire bricks and now should redesign its hot boxes which can be made from any old container stuffed with insulating material, even an old cardboard box.

The more simple and cheap the technologies are the better. The most useful “technology” is a wind guard for open fires. Some technologies, particularly the solar ovens are too expensive to copy.

NaDEET recognises that it will need to provide more consistent support to make a significant impact in very poor communities.

Efficiency

NaDEET runs the community course at the Centre most efficiently and is able to provide full tuition, materials and a residential, full board course for N\$275/person/day.

NaDEET's shift of emphasis towards training and providing sustainable living technologies has diverted considerable human resource energy from its main focus of providing Environmental Education. *"Teaching about SLT is OK but distributing them is a mission"* (staff member).

Each community and age group has particular needs and abilities regarding the choice of SLT which is most appropriate for them. For NaDEET to transport solar cookers and 20litre tins down to the desert or on outreach tours is a logistical challenge and cost. However, it is difficult to suggest alternative ways that poor and remote communities can access them.

Outreach Tours are time consuming. NaDEET's experience in Kavango East found that 6 hour workshops in one community was not long enough; A participant in Rehoboth commented that 2 days was too rushed and it should be a minimum of 3 days as the public interest was so high. Although outreach is costly, it reaches communities in need which do not generally have access to such experiences.

Sustainability

The activity of providing education will always require funding and is not self-sustaining. Sustainability in terms that communities will be able to make or afford to buy their own SLTs is possible in the very long-term.

Awareness is one important ingredient to achieve sustainability. All participants at the Centre learnt how to measure their water and energy use. NaDEET has demonstrated that their increased use of solar cooking and fuel efficient stoves in 2012 resulted in the centre reducing CO₂ output by 35% from 2011. Community members are impressed by this and one teacher has been inspired to monitor his own use.

Other suppliers of SLTs: For the long term sustainability of this action, NaDEET needs to explore ways and linkages with other organisations which can take over the responsibility of assisting communities to access to sustainable living technologies. In the meantime, NaDEET is an important supplier and needs this practical component to reinforce the EE approach.

Lessons Learnt

Identifying appropriate participants for SLT workshops

The deputy mayor in Stampriet wants to organise a visit to NaDEET for older women, having realised that the youth were not a very successful group. We saw schools with drinking standpipes which waste water – the school maintenance person could be inspired to introduce water and energy saving actions if he was exposed to them.

Major users of firewood in Namibia who are not specifically targeted by NaDEET are the daily MoE school feeding programme, feeding the children who stay in school hostel, the many community based ECD centres and the large number of soup kitchens who cook for the most vulnerable in some communities. Only one school feeding programme fireplace

had a wind guard and another had the original fire guard to maximise fuel efficiency (**Photo 9 and Photo 10**).



Photo 9. Unguarded fire with potjie - the norm



Photo 10. Original school feeding programme fuel efficient stand

Solar cooking is not appropriate for the school feeding programme because the food is prepared before the sun is hot (it needs to be ready for the first break at about 9am) and because of the large numbers (from 70 – 400 children depending on the school). It could make a contribution to hostels and lunchtime meal providers.

Sometimes there is one cook, but other schools rotate the cooking among different parents. In Uibis, one lady prepares school feeding for 70-80 learners a day and two other ladies use firewood to cook for 42 learners who live in the hostel. The only school we visited that did not have a feeding programme was Mariental Secondary School, but it does have a hostel which cooks with electricity.

Would Conservancy committee members be another possible interested target group?

It is very difficult for people in remote rural areas to find materials to make products they were taught e.g. (newspapers for fire bricks or containers to make FES). Giving them examples of where to source the materials, such as the library may help. Targeting the vulnerable communities in peri-urban and informal settlements may increase the efficiency and effectiveness of the programme. Remote rural communities tend to be aware of minimising their water and electricity consumption.

Identify and nurture Champions

In most communities there are a few community activists such as Veronika Katjikuru in Maltahöhe and Jacques Coetzee's family in Stampriet. They are those wonderful people who do good deeds, enjoy networking, sit on every committee and make the community function. The school cleaner at Witkrans also sometimes cooks for the feeding programme and he seemed to have potential. On our visit, we learnt that the very dynamic CEO of the Stampriet village council, who was very enthusiastic about NaDEET had died in a car accident and the village still has a leadership gap; NaDEET lost an embryonic champion.

Giving activists the knowledge and skills to become Environmental Champions is one key to increasing the effectiveness and sustainability of the action. Identifying and then targeting the community activists and the people who have the motivation and capacity to adopt SLTs is difficult from NaDEET. An on-going outreach programme has much more potential to identify and nurture such people; they are usually known to government officials. We have seen that even if a school does not send the relevant subject teachers, they have the potential to become enthusiastic.

Identifying and then following up with such Environmental Champions in schools and communities is important. One possible reason why Stampriet failed to follow-up with NaDEET is their very dynamic leader of the village council, who was very enthusiastic about NaDEET, died in a car accident and the village still has a leadership gap.

More tailored interventions to suit local conditions

The pre-test at the centre provides an opportunity for the educator to assess the group's background. On outreach, the introductory meeting needs to be fact-finding so that the programme can select the appropriate demonstrations to fit.

Sustainable living technologies need to be kept as relevant, affordable, accessible and simple as possible e.g.:

- Simplify the solar oven design but ensure it is still effective if this is to be used as a SLT demonstration.
- Demonstrate with some loose bricks/rocks how to build protection for very large potjies common at feeding centres.
- Demonstrate heating a clothes iron on a solar cooker
- Promote use of hot box for homes and schools with electricity
- Demonstrate use of hot box out of cardboard or cloth, not wood and its use as a cool-box / fridge
- Demonstrate the principle of a water-cooled "fridge" wet cloth, box with charcoal lining.
- Conduct further research to source low cost, effective sanitation technologies.

Recommendations

6. NaDEET should target vulnerable communities in informal and urban settlements which are more likely to adopt new ideas, have greater access to materials for recycling and are easier for NaDEET to support.
7. NaDEET should encourage schools to send their school maintenance person and/or cook(s) to the NaDEET outreach points and Centre programme.
8. NaDEET should foster greater links and partnerships with COSDECs, KAYEC, Bicycle Empowerment Namibia, WAD and SMEs which could be trained to make and support sustainable living technologies for sale around the country.
9. NaDEET should demonstrate fuel efficient stands for large pots (used still in Uibis) to the national organisers of the MoE School Feeding Programme so they can order and distribute again to all schools which use wood.
10. NaDEET should hold a week at NaDEET targeting only Environmental Champions and then plan how to actively follow-up with community and school champions.

5 Environmental Education targeting Educators

NaDEET's Result Area 4: Enhanced implementation and teaching of sustainable living by 60 educators and 6 tertiary level students in various learning settings (i.e. schools, community programmes, environmental education centres).

In this results area, NaDEET exceeded its target by reaching a total of 73 educators and 6 Polytechnic of Namibia and UNAM interns who each were exposed to all aspects of the Centre's work over a 6 month period, during the 3 years.

5.1 Educator Groups

The educator programme (Result 4: Enhanced implementation and teaching of sustainable living by educators) is open to environmental educators, community activities, school teachers and other relevant educators. It is a training of trainers programme to multiply the number of educators teaching about sustainable living. NaDEET exposed five groups of educators, tertiary students from the Polytechnic and one UNAM graduate and community trainers on three courses at the Centre during the project period. Each course had very different types of participants:

Table 7. Summary of participants on NaDEET's educator course

Year	Type of participants	# Organisations participating	Total # participants	Total # female participants	Total # male participants
2011	20 community workers through Anglican AIDS Programme, from Northern Namibia	1	20	12	8
2012	16 government youth officers and coordinators from every region.	1	16	5	11
2013	13 Polytechnic NEAT club members, 12 UNAM Oshakati enviro club members, 2 teachers, 1 tour guide and 1 MET officer.	3	29	12	17
Totals		5	73	33	40

The 2011 educator group were community workers (60% women) mostly from the Oshana and Oshana Regions, who were exposed to NaDEET's regular topics, including active skill building elements and how to take this knowledge to communities¹.

“Yes! I have got more knowledge that I will use to my family and community people how they [can use] their environment sustainably. This workshop prepared me to go to teach people how they can create bucket showers, manage water and electricity and solar ovens.”

In 2012, sixteen youth officers and coordinators from the environmental education unit at the Ministry of Youth, National Service, Sport and Culture attended a “training of trainers” programme at NaDEET to enable them to improve the quality and content of the environmental education activities they offer to youth nation-wide². In addition to the practical sustainable living experience and auditing of their enviro-footprint while at the centre, participants created an environmental problem tree, examined the links between “development” and climate change, and compared the efficiency of different energy sources. The programme covered current environmental problems and solutions, educational methods, activity, programme and material development. They were given many ideas and experiences which they could use as educators in their jobs.

“This was my first exposure to environmental education learning and I gained valuable skills that will help me to carry out my work differently” (Youth officer).

To add value to the experience, NaDEET secured other sponsorship (from the Dutch-based COV fund) to provide free-of-charge appropriate sustainable energy technology to the group. This included 10 parabolic solar cookers and 15 fuel-efficient stoves.

In 2013 NaDEET combined three different groups together for the educator course. The environmental clubs from the UNAM Oshana and the Polytechnic of Namibia had applied to come to NaDEET. In addition NaDEET advertised the course in the newspaper for individual participants to apply. In total almost 70 people applied, of which 11 were chosen, but for no clear reason only 4 attended despite having signed to confirm their attendance. The programme itself was very well received.

We gathered no first-hand information to evaluate the success of the educator courses.

5.2 Student Internships

NaDEET provides internship positions to second and third year students at the Nature Conservation Department of the Polytechnic of Namibia and the EU project funds their stipend (N\$1,300/month), accommodation and living expenses. The six students actively participated in all aspects of the Centre's activities notably outdoor teaching, programme and activity planning and assisting with the Centre's logistics. The experience provided them with hands on EE experience and broad, valuable workplace skills.

The PoN upgraded the Diploma in Nature Conservation to a bachelor's degree, which meant that NaDEET only had the opportunity to take in one student per year. In 2012 therefore the student from 2011 extended his internship for a second six months. The July - December 2012 and 2013 internships were filled with PoN and UNAM graduates after

¹ NaDEET 2011. “Interim narrative report Annex VI”.

² NaDEET 2012. “Interim narrative report Annex VI”.

advertising. (UNAM courses only enable undergraduate students to take four week internships which are no help to an employer such as NaDEET).

Feedback from three interns we met showed that they had gained valuable skills and a lasting appreciation for the environment. For the EU-funded interns to date, NaDEET employed 2 and MET employed 1' two are still studying or are only finishing at the end of this year. (Overall since 2003, NaDEET has employed 6 interns and MET employed 5 of these 6 after they had worked for NaDEET and one student.

6 Environmental Literature

NaDEET aims to provide relevant environmental literature targeting all ages, in order to promote and encourage environmental learning and literacy.

6.1 Bush Telegraph

NaDEET publishes 2 copies of The Bush Telegraph per year and the topics of the six editions covered in this funding period are:

- Forest for the people
- Protecting our Night sky
- Sustainable Energy for all - the need for renewable and efficient energy sources
- Deserts to support the United Nations Convention to Combat Desertification (UNCCD)
- Environmental Education
- It's more than just food

Although the 12 page colour booklet, A5 size, targets mainly the youth, it is informative for people of all ages. It addresses the five aspects of EE (awareness, knowledge, skills, participation and attitude) in an engaging and stimulating way that aims to promote a healthy environment. The booklets aim to:

- Empower children/teachers to make informed decisions about the environment and their own lives in a way that could enhance sustainability
- Assist teachers and children in linking their school curriculum to the world around them; it enhances environmental awareness and some teachers use it to supplement the curriculum.
- Instill a sense of personal responsibility in children towards their natural resources and particularly to environmental degradation.
- Stimulate and encourage the reader to become involved in the management of the environment.
- Foster a forum for school children, teachers and EE practitioners to learn, debate, and share Namibian environmental issues and the challenges it faces.

The Bush Telegraph is available on the NaDEET website but few schools and communities have access to internet. Therefore it prints 18,000 copies and posts over 16,000 copies to individuals and schools and also some bulk orders to the MET in Ongwediva and Katima Mulilo and to the PoN (Department of Agriculture and Department of Nature Conservation). More than 100 educators have requested to receive multiple copies for use as supplementary learning materials. The remaining 2,000 copies are distributed to learners at the centre and at events.

6.2 It's Time to Grow

The MoE is increasing the number of primary schools which offer pre-primary education to 5-6 year olds. NaDEET's sustainable living booklet, *"It's Time to Grow"*, aims to support learning at the early childhood and pre-primary level and/or even Grade 1 depending on their previous educational background; it is written in line with the Namibian school curriculum. The learning pack consists of the following:

1. Four booklets that engage the child in stories, activities and games
 - Animals & Plants
 - Recycling
 - Sun
 - Water
2. Growth chart which is a fun support tool as it includes numbers, letters and shapes and gives children the opportunity to track their own physical growth.
3. Crayons that a child can use to write, draw and colour in.
4. Recycled seed disc which encourages children to take action at a young age by planting the seed and nurturing it.

The learning pack aims to create awareness about the environment. It encourages teachers and parents to engage children of between 4-7 years old in learning about environmental topics, cause and effects while learning skills in basic numbers, alphabetical letters, colours, shapes and concepts.

In September 2013, NaDEET conducted an outreach trip to Gibeon and Mariental to distribute the pack to appropriate schools and kindergartens and to test it. The Hardap Region MoE Head office had invited NaDEET to present the learning pack during an in-service pre-primary teacher workshop. It was an ideal setting to meet with all the teachers and get the booklet into schools. NaDEET then visited WM Jod Junior Primary School as it was the only school in the Hardap Region that had not come to NaDEET since the school is only lower primary. This visit enabled NaDEET to reach all schools in the region. The feedback was useful:

- One teacher translated the introduction into Afrikaans
- It needs a teacher's guide to maximise benefits.
- If teachers are taken out of class, NaDEET needs to prepare activities for the children to do.

6.3 Evaluation of NaDEET's Literature

Impact

Feedback gathered on the Bush Telegraph shows there is an insatiable demand for literature of all kinds in schools. Both adults and children described with smiles how they enjoy reading the Bush Telegraph. The children liked the variety, the content and the pictures.

NaDEET has phoned the schools which receive the Bush Telegraph and asked the teachers how they use it. Common responses include: *"I use it in my class"*; *"in my science class"*; and *"as a supplement"*. We heard similar responses: *"We use the information from the pamphlets which we get by post"* (Witkrans PS). Only two teachers admitted that they did not use the Bush Telegraph in the classroom.

We saw NaDEET's posters up in most of the schools we visited – in a classroom and library room.

NaDEET also counts the number of “likes” to a story on the NaDEET Facebook page which has been over 300. This also indicates reach and impact.

Relevance and Appropriateness

NaDEET staff usually writes the content but they also call in an expert in the topic as a reviewer. The edition on *Sustainable Energy for All* was funded by the Renewable Energy and Energy Efficiency Institute (REEEI) of the PoN. They also suggested specific topics they wanted included. This collaboration also enabled copies to be distributed to a wider audience, increasing both NaDEET's and the EU's visibility.

Feedback received from the pre-primary school teacher at Anna Maasdorp on the booklets “*It Is Time To Grow*” confirms it is appropriate for the age level and provides lots of fun for the children. She suggested that the letters should be bigger and that it should be available in Afrikaans as the common language medium for most ECD centres and primary schools in the South and Central Namibia.

Effectiveness and Efficiency of the mailing list

The mailing list grows annually as every person attending NaDEET is invited to subscribe. The Excel database records the relevant contact details and the date of the first subscription. Since the first subscriptions in 2003, removing old addresses from the mailing list is a challenge. NaDEET now sends the mailing to all individuals at one school, in one envelope. The teacher in Uibis reported that he distributes it to the learners who attended.

The teachers and learners confirmed that they are receiving the Bush Telegraph. The Mariental teacher said they are alerted by email and Facebook that a new addition is available for download from the website.

NaDEET is constantly updating its Bush Telegraph mailing list but it still is unsure how many, if any, are unread.

NaDEET could explore the possibility of using bulk SMS messages to send out environmental messages and notify people of the Bush Telegraph, etc.

Recommendation

10. NaDEET could explore producing a newspaper supplement as an alternative or in addition to the Bush Telegraph (like *Abacus* of the early 1990s and recent educational booklets produced by the Legal Assistance Centre).

7 Programme management issues

7.1 Results from the SWOT analysis

Nine staff members were given cards and individually wrote what they regard as internal strengths and weaknesses, and external opportunities and threats to the Centre programme. These are added to during the follow-up discussion (**Table 8**).

Table 8. Results of staff SWOT analysis on the Centre programme

<p>Strengths</p> <ul style="list-style-type: none"> • Location • Unique programme • Student internship programme and volunteers • Successes in establishing solar usage in Namibia • More awareness in Region • Reaching more learners (x2) • Getting the MoE involved (x2) • Staff dedication • Reaching goals • Good communication (x3) • Problems solved on time • Centre Programme is not dependent on financial situation of learners' families • Staff can learn from participants 	<p>Weaknesses</p> <ul style="list-style-type: none"> • Accessing sufficient resources (x2) • No country-wide awareness • Inadequate communication between staff and groups of people visiting beforehand. • Schools travel very long distances to reach the centre so often arrive late • Attendance: Community members less reliable than schools • Dependent on donations / funding (x4) • High turnover of staff (x3) • Distance for staff to get home to their families • Time (x2) • Sustainability
<p>Opportunities</p> <ul style="list-style-type: none"> • Nurture link with MoE to retain transport support. • NaDEET Franchise at other EE centres e.g. SOPs • Mentor and support Vihlo to implement in Namutoni. • Link with Sonop PS which has a craft and technology teacher/class • Involve local lodges, businesses during outreach – they can add resources. • Link with SME SLT training – e.g. KAYEC, SME Compete • Link with the Scouts of Namibia • Link with B2Gold in Otjozondjupa which is building an EE centre and has CSR programme which is supplying 400+ people with firewood from the mine clearance. 	<p>Threats</p> <ul style="list-style-type: none"> • Leaving of staff/teachers • Distance • Transport money home • Time • # of staff • Sustainability • Resources • Lack of funding

In discussion afterwards, some of these were explained more thoroughly:

Time: Time was perceived as the biggest weakness and threat to the programme. *“It is the same every week - the programme is too tight”; “a lot of activities to squeeze in, which is made worse if the group arrives late”; “Too many jobs for too few staff”; “it is difficult prioritizing workload”; “There is a lot of admin. Everything has a policy and procedure”. “The EU funding has enabled us to bring in more schools, produce more literature and has added on more activities, such as the outreach”.*

Attendance: *Community members are less reliable than schools.* On several occasions, the agreed number of community members failed to attend the course, thus reducing NaDEET’s ability to reach its targets.

Communication: Communication with the schools is always difficult – they are rarely on email so NaDEET has to use telephone, fax and SMS. The internet repeater at the office has helped to improve communications with the world beyond the desert.

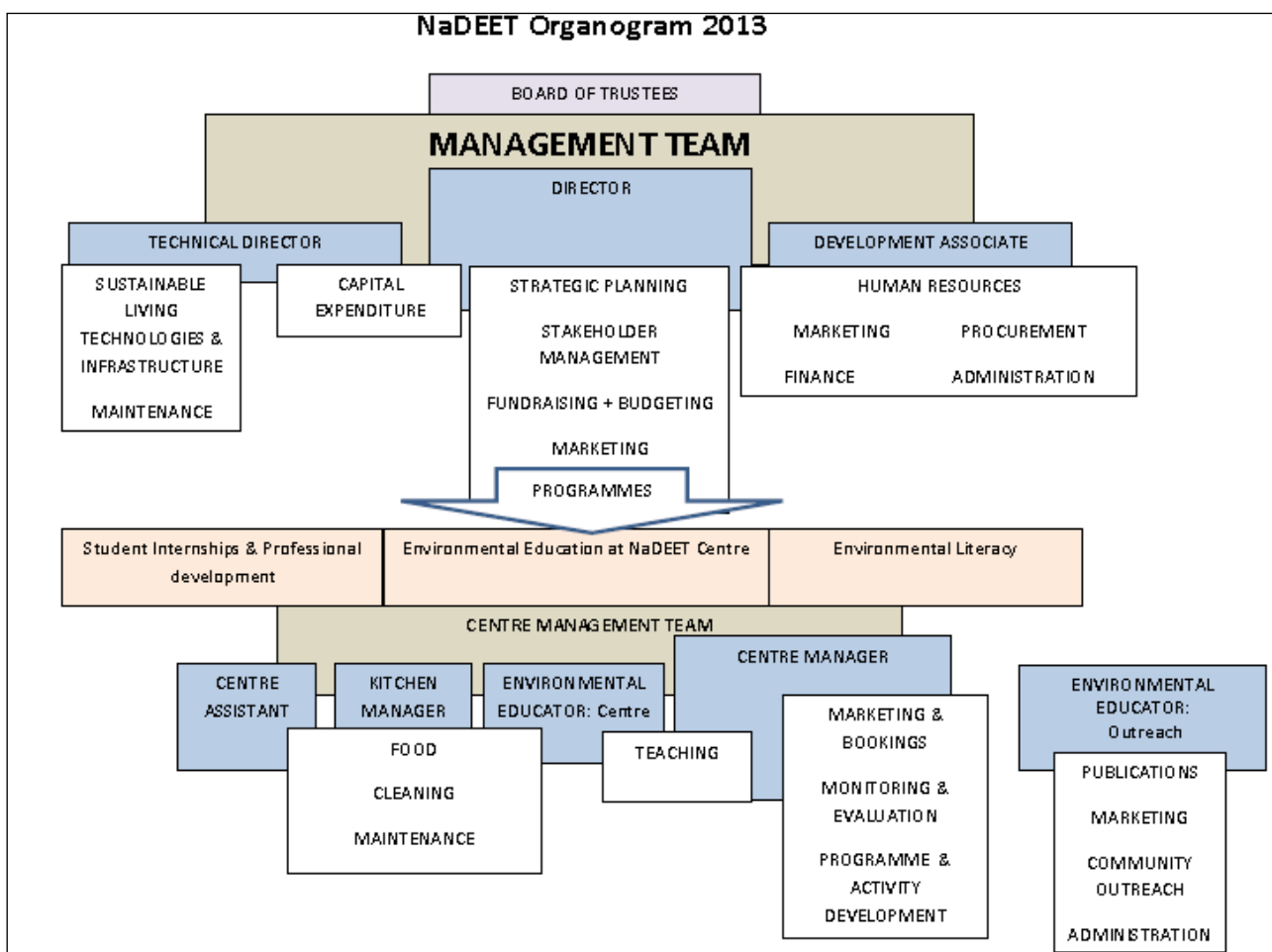
Language: Only one staff member speaks Nama and Afrikaans, the dominant languages of the region.

Organisational Issues: Demand for the centre has over-reached supply.

7.2 Human Resources

During 2013, NaDEET had 10 staff comprising of employees, long-term volunteers and students, with the whole organisation overseen by a Board of Trustees. The organogram (Figure 5) shows a flat structure, headed by Viktoria Keding, the director and co-founder of NaDEET. “Everything is a group effort here” (Centre staff member).

Figure 5. Organogram of NaDEET 2013



NaDEET is a lean and efficient organisation with excellent management that promotes staff dedication. Of the three people on the management team, only the Development Associate lives permanently on site since January 2013 and this has not impacted too negatively on its performance. She provides the data and manages many aspects of human resources but the director retains final approval on all major decisions and the system has worked well.

Issues

Qualified teachers: The director is the only staff member with strong pedagogical skills. The two current educators are leaving after giving good service and NaDEET has recruited a new centre manager with great educational experience which should address this weakness. The centre would benefit from an additional educator as the centre is fully booked and utilised throughout the year.

Improved accountability: About one third of the groups visiting the centre are funded by the EU. “The programme requires greater accountability to show we are meeting our objectives”; “more data and proof - tighter monitoring such as the pre and post-test survey

analysis". Monitoring to track progress towards the results has proved to be very demanding and time-consuming.

Staffing levels: This was NaDEET's first large scale funding proposal and it did not request enough human resources to run the EU-funded programme, which it had to make up from other sources. In particular, the Development Associate spent more than half her time on the project yet NaDEET only allocated a third of her time to the project. There is need for more office staff with Excel, writing and organising skills.

Staff turnover: NaDEET experiences all examples of staff turnover – four people have given long term commitment to the organisation, some have stayed for a few years and some leave after a short time – volunteers and interns exacerbate the short term turnover. To encourage staff commitment, NaDEET has an Education Fund which is available for any staff who have been at NaDEET for more than a certain length of time. NaDEET gives 10 days study leave and pays for transport to a course. It has been used for driving licences, first aid courses and PoN courses which have all benefitted the individuals and the organisation. The remoteness of the centre makes it difficult for staff to take leave to keep in good contact with their families and the continuous shortage of drivers compounds the problem. Staff accommodation at the desert centre is an on-going problem as staff numbers expand faster than the planned infrastructure.

Recommendation

11. NaDEET should critically review the many Centre tasks to reduce or streamline those which are too time-consuming.

7.3 Monitoring, Evaluation and Reporting

Measuring change to track the progress and impacts of the Project's objectives and results has been a huge challenge. Most of these are not "SMART" results – specific, measurable, achievable, relevant and time bound which makes it very difficult to identify indicators to measure progress. The general aims to plant the seeds of environmental awareness and improve the quality of life are laudable but immeasurable. It is commendable that the EU recognises the importance of what NaDEET is doing in spite of the challenges with the logframe.

Pre and post survey

The centre uses a pre and post survey to assess short term changes in knowledge, skills and ethics required to measure Results 1 - 3 of the logframe.

Some questions continue to remain not well understood by participants, even after re-wording in 2012: "What is the Environment?" still remains a challenge for many learners. It is a topic which NaDEET discusses on the first day and it is only marked correct in the post test if participants include all three components - living, non-living and human things. There is some difference in the answers between NaDEET's two educators – one perhaps makes more effort to link the concept throughout the week but every educator will have strengths and weaknesses.

Many children in the region are not confident or competent in English and some of NaDEET's more complex concepts may get missed by teaching in English. It may also be influential in understanding the Pre- and Post-visit questions.

The Visitor's Database

NaDEET captures details on each school group that visits on separate Excel worksheets in one file. In the current format, only a limited amount of this data is analysed by computer; it is largely collated manually which is time consuming.

Reporting

NaDEET's reports are detailed and show that through rigorous, on-going self-evaluation it constantly strives to analyse, learn, adapt and fine-tune its activities to improve the programme's impact and results.

Main Challenges

The multi-component, difficult to measure results as discussed above.

All the data capturing and processing is on paper and Excel which is very time consuming and time pressure was identified as the main organisational constraint during the SWOT analysis.

For every group, every week, it takes the educator about 4-5 hours to collate and enter all the pre and post survey data into Excel. Responses from individual pre and post tests are counted on a summary sheet, by question for each group, by the educator. These are then entered onto a summary Excel sheet which records the results for each school group for each pre-and post test question to generate statistics on change in knowledge, ethics and skills.

This can be made more efficient by adopting new information communication technologies (ICT), especially applications on tablets and smart phones. Learners could enter their own data which is then easily transferred to a central database, such as Access which can easily analyse it and generate reports. It is an area which has become a lot more affordable than PCs.

Recommendations

12. The EU should allow NaDEET to overhaul and revise the logframe for the new EU project to make the objectives and results SMART, which will lead to manageable and measurable indicators.
13. NaDEET should explore the use of new ICT as learning tools and to make its M&E systems more efficient.
14. NaDEET should translate the Pre and Post surveys into Afrikaans for community groups and primary schools.
15. NaDEET could monitor website hits and Bush Telegraph downloads as a measure of their reach.

8 NaDEET's Sustainability

NaDEET has grown from a small hand-to-mouth operation to an internationally recognised environmental education centre in ten years. The EU funding has enabled NaDEET to move to another league and the EU has committed funding for a further three years for a more focused community outreach programme.

Nevertheless, NaDEET is careful to maintain sustainability of funding through fostering its links and programmes with other donors and development partners such as UNESCO, the

COV fund, the Lions Clubs Germany and also the Namibian private sector through NedBank's Go Green, Rotary and the Sapphire Foundation (Namib Rand). An unexpected impact of EU funding has been to strengthen NaDEET's visibility overseas; it receives more feedback and praise than before the action.

The director expands the benefits of the EU programme by adding more components with other donor funding (e.g. to provide more SLTs for educator groups). This should be encouraged at all times.

The review team considered how sustainable the organisation is, given it has a single driver – the director and founder. We are impressed with all the Standard Operating Procedures as a tool which has created sound institutional memory. The Centre continues to thrive, even once the director moved to Swakopmund. These are clear indications that, like other institutions in Namibia with strong founding leaders (e.g. DRFN and KAYEC) NaDEET will continue beyond the life of its founder.

NaDEET has all the institutional experience to replicate its systems elsewhere and could establish centres in other places in Namibia. It would allow easier access to its programme for schools and communities in other parts of the country. It would also enable staff to rotate which may reduce some staff turnover.

NaDEET's prime aim is Environmental Education but there is an additional component of the project which requires action-taking. In terms of effectiveness, efficiency and sustainability of the action, older participants are more likely to be able to take follow-up action in their schools, homes and community. The *"Its Time to Grow"* booklet, targeting very young children, can only raise awareness and primary school children need further guidance and supervision from adults to follow-up. The review found that many children and adults have tried to change their behavior and this is exciting. Empowering older learners who require less adult assistance and community members who control the use of household resources, may bring about greater possibilities for measurable short to medium term change.

More significant follow up action needs champions – we call them Environmental Champions - and we found a few in secondary schools and some as community activists in Rehoboth, Stampriet and Maltahöhe. They could play a key role in broadening the uptake of NaDEET's ideals and sustaining the action.

9 Conclusions

The verbal feedback from children and adults show that NaDEET's strategy of mixing practice with theory is an effective and powerful environmental education learning strategy that has enabled both children and adults to retain desirable environmental ethics and knowledge for several years. We agree with one teacher who felt these are such powerful experiences that they will be retained for a lifetime and are likely to be passed on to their children.

Not only has environmental learning been imparted to both children and teachers but visiting the Centre has *"shown many Namibians a world beyond their own community"*.

The evidence shows that NaDEET has achieved Results 1-3: Improved environmental ethics, knowledge and skills for environmental action taking; and increased access and ownership of environmental education opportunities and sustainable living technologies, especially for the most vulnerable groups.

The only evidence we have seen for Result 4 (Enhanced implementation and teaching of sustainable living by educators and tertiary level students in various learning settings) has been from the six NaDEET interns who worked at the centre for 6 months. We know the other activities took place but the result requires data which reflects the quality of the educators' performance before and after the 4 day course, which we do not have.

Through the production and widespread distribution of the Bush Telegraph, NaDEET has achieved Result 5: increased access and use of locally based, relevant environmental literature for Namibians, especially for children, educators and community members. The learning pack "It's Time to Grow" is praised by teachers of young children and it now needs to be more widely disseminated.

Apart from the reduction in its own enviro-footprint, there is little evidence that NaDEET has made a significant impact in achieving the very ambitious Result 6: Better protected local environment (especially water and energy resources) and improved quality of life. Poor households are less wasteful of resources and have relatively small enviro-footprints. Most participants do not have the financial means and access to resources to adopt some of the technologies, but they say they know how and do what they can. There was some adoption of SLTs by community members (no data is available to quantify this) which would reduce CO₂ emissions. In the feedback sessions, it was clear that participants who attended the NaDEET Centre remain conscious of not wasting water and energy and not littering.

As staff at NaDEET realise, they have sown some seeds and created some awareness but NaDEET has many years to go before the project will make a significant impact towards raising living conditions whilst protecting the environment. The project is relevant to all target groups, the environmental education methods are very effective and efficiently carried out.

NaDEET was able to manage the increased demands in programme management which came with the EU funding because of its competent management which had already put many systems in place. Its shift of emphasis towards training and providing sustainable living technologies has diverted considerable human resource energy away from EE. With the pressure to pass on skills to enable people to adopt SLTs during outreach, there is a risk of losing the important wider environmental messages which can best be achieved through its environmental centre, which should be replicated.

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Appendix 1 Terms of Reference



NaDEET is a non-profit organisation based in the Hardap Region whose mission is to protect the natural environment of Namibia by educating its citizens to practice a sustainable lifestyle. For our current three year EU-funded project “Environmental Education to Empower Namibian Communities to Improve their Living Conditions” we have three exciting opportunities:

3) PROGRAMME EVALUATION CONSULTANT

NaDEET seeks a professional evaluator to track the effect of NaDEET’s programmes on individuals, families, communities and the environment on a long-term scale towards making Namibia society more equitable and sustainable. Evaluation results to be presented in a reader friendly case study format.

Requirements: M & E specialist with experience in programme evaluation and knowledge of environmental education

Application due: 21 June 2013

Application instructions:

Contact us at admin@nadeet.org, fax: 063 693013 for full application procedures. Please specify which opportunity you are interested in.

This publication has been produced with the assistance of the European Union. The contents of this publication are the sole responsibility of NaDEET and can in no way be taken to reflect the views of the European Union.

I. The programme evaluation consultant is to:

- 2) Conduct an external evaluation of NaDEET’s current 3 year EU funded action that includes:
 - a. 33 NaDEET Centre programmes for school children, community members and educators
 - b. 3 Community and school outreaches
 - c. Distribution of sustainable living technologies to the communities including solar cookers, solar ovens, fuel efficient stoves, recycled paper bricks, bucket showers and solar lamps
 - d. 6 Bush Telegraph magazines
 - e. 1 Sustainable living booklet- “It’s Time to Grow”
- 3) Refer to the logical framework for the project and align evaluation with the expected results and the objectively verifiable indicators of achievement of the action

The consultant will need to visit NaDEET to gain an appropriate understanding of the action and interview staff. The consultant will also need to visit a select number of schools and communities in the Hardap Region to measure implementation success.

II. NaDEET to provide:

- 1) Full project proposal including logical framework
- 2) Comprehensive database of all programme participants

- 3) Participant pre and post programme surveys
- 4) Interim reports
- 5) Copies of publications
- 6) Photographic evidence
- 7) Accommodation at NaDEET during visit

III. WORK TO BE DELIVERED

Consultant to provide evaluation presented in three formats:

- 1) Summary of evaluation results in a logical framework table
- 2) Written report
- 3) 16 page A5 case study booklet – “best practices guide”

NaDEET to review before final version is produced. All formats to be submitted electronically and as one print copy.

To apply, please send a quotation detailing:

- 1) # of days of work
- 2) Transport costs
- 3) Accommodation costs
- 4) Proposed methodology
- 5) Previous experience and references
- 6) CV or company profile
- 7) Date of delivery of final products

Make sure to include incidental expenditures as these may not be claimed later.

Please certify in your application that you are not in one of the situations listed below:

<h4>1.1 Grounds for exclusion from participation in procurement</h4>
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Candidates or tenderers will be excluded from participation in a procurement procedure if:

they are bankrupt or being wound up, are having their affairs administered by the courts, have entered into an arrangement with creditors, have suspended business activities, are the subject of proceedings concerning those matters, or are in any analogous situation arising from a similar procedure provided for in national legislation or regulations;

they have been convicted of an offence concerning their professional conduct by a judgment which has the force of *res judicata*;

they have been guilty of grave professional misconduct proven by any means which the Beneficiary can justify;

they have not fulfilled obligations relating to the payment of social security contributions or the payment of taxes in accordance with the legal provisions of the country in which they are established or with those of the country of the Beneficiary or those of the country where the contract is to be performed;

they have been the subject of a judgment which has the force of *res judicata* for fraud, corruption, involvement in a criminal organisation or any other illegal activity detrimental to the Communities' financial interests;

they are currently subject to an administrative penalty referred to in section 2.3.5 of the Practical Guide to contract procedures for EC external actions.

Candidates or tenderers must certify that they are not in one of the situations listed above.

1.2 Exclusion from award of contracts

Contracts may not be awarded to candidates or tenderers which, during the procurement procedure:

- (a) are subject to a conflict of interests;
- (b) are guilty of misrepresentation in supplying the information required by the Beneficiary as a condition of participation in the contract procedure or fail to supply this information.

Appendix 2 Logical Framework with summary assessment

	Intervention logic	Objectively verifiable indicators of achievement	Progress towards results / Review comments/ Alternative indicators
Overall objective	To empower Namibians to make decisions for a sustainable future.	National indicators demonstrate decreasing poverty, improved environment.	Inappropriate indicator for this project. We suggest: % of learners, teachers & community members who demonstrate knowledge how to live more sustainably. 100% of individuals interviewed and members who spoke at FGDs gave at least one method to live more sustainably. Most participants do not have the financial means to adopt some of the technologies, but they say they know how and do what they can.
	To create a more equitable and inclusive Namibia as we promote awareness, education and implementation of a sustainable interaction between humans and their environment, particularly focusing on underprivileged sectors.	Decreased disparity in income and quality of life.	EU monitoring report proposed some good overall impacts: All participants would have been empowered (i) to make changes for a more sustainable lifestyle, (ii) to serve as role models and leaders in their community; (iii) to contribute to reduce poverty by decreasing dependence on natural resources such as fossil fuels, wood and water; and (iv) to contribute to mitigate the impacts of environmental change by adopting household energy practices that reduce carbon dioxide emissions.
	To protect the natural environment and its resources	National indicators show stabilisation and improvement in natural resources (trees, water etc.)	The project is yet too small an impact to expect this change.

	Intervention logic	Objectively verifiable indicators of achievement	Progress towards results / Review comments/ Alternative indicators
Specific objective	To offer holistic, complementary environmental education programmes in order to provide the awareness, skills and knowledge for Namibians to improve their quality of life, and thereby the natural environment, as they choose to participate in finding viable solutions to their local and national environmental issues.	There is increased action and dialogue on local and national levels regarding sustainable living, via multiple avenues (e.g. community action days, media coverage, sustainable living technologies).	See comments above.
Expected results	1) Improved environmental ethic among Namibians	1. Approximately 1000 Namibians participate in the NaDEET Centre programme 2. More than 50% of project participants have improved values and attitudes towards the environment	1060 School and community members attended NaDEET Centre programme (467 female & 399 male learners, 57 teachers and 128 community members). Pre-post visit survey is adequate. Challenges include how participants understand and interpret some questions and the strictness of the marking criteria. We suggest translating into Afrikaans and simplifying the questions further.
	2) Improved knowledge and skills for environmental action taking.	1. Approximately 1000 Namibians participate in the NaDEET Centre programme 2. More than 50% of project participants have improved knowledge of environmental problems in Namibia 3. More than 50% of project participants have improved skills in sustainable living (solar technology, water saving and waste management)	1060 School and community members attended NaDEET Centre programme. All participants learn how to measure their water and energy use and waste output. Indicators appropriate to measure the result.

	Intervention logic	Objectively verifiable indicators of achievement	Progress towards results / Review comments/ Alternative indicators
	3) Increased access and ownership of environmental education opportunities and sustainable living technologies, especially for the most vulnerable groups	1. Approximately 1000 Namibians participate in the NaDEET Centre programme 2. Transport fund assists 33 schools, communities and educator groups to come to NaDEET Centre. 3. Outreach tour increases awareness of NaDEET Centre and sustainable living to more than 90% of Hardap Region schools 4. Approximately 120 fuel-efficient stoves are owned by community members 5. Approximately 60 parabolic solar cookers are owned by community members 6. Approximately 6 solar ovens are owned by community members	1060 School and community members attended. Transport Fund enabled 16 community groups to travel to NaDEET, valued at N\$114,454.50. During the second year, the MoE Hardap Region announced that it would fund the transport of schools. Indicators appropriate to measure the result. SLTs distributed total: - 173 solar cookers (both models- the large one from Dobra and the new small one) - 140 fuel efficient stoves - 8 solar bottle lights - 4 bucket showers - 2 solar ovens
	4) Enhanced implementation and teaching of sustainable living by educators and tertiary level students in various learning settings (i.e. schools, community programmes, environmental education centres).	1. Approximately 60 educators participate in NaDEET Centre programme 2. Approximately 6 students complete practical training at NaDEET 3. More than 50% of educators implement sustainable living education in their teaching syllabus	73 Educators attended NaDEET (not included in total above). Indicator 2. 6 Internships completed. NaDEET is in close contact with previous interns who all report implementing messages learnt. "Enhancement" needs a benchmark e.g. a Pre-test, for each participant and a follow-up after several months. Indicator 1 & 2 only partly measure the result. Suggested revision to Indicator 2: Three interns demonstrated knowledge &/or teaching skills in sustainable living between 6 - 12 months of leaving NaDEET. Indicator 3: Very difficult to measure due to loss of contact with educators. (Recommend: Maintain email and SMS contact and follow-up questionnaire within 6 months).

	Intervention logic	Objectively verifiable indicators of achievement	Progress towards results / Review comments/ Alternative indicators
	5) Increased access and use of locally based, relevant environmental literature for Namibians, especially for children, educators and community members	<ol style="list-style-type: none"> 1. Six Bush Telegraph magazines are printed and distributed to mailing list 2. One "It's Time to..." booklet produced and distributed on relevant sustainable living topic 3. More than 13,000 Namibians receive environmental literature 4. More than 50% of educators from educator programme subscribe to mailing list 	6 Bush Telegraphs produced; 18,000 printed of each; 16,000 mailed per issue. Most interviewees had not seen "Its Time to Grow (ITTG)". Schools still desperate for more literature. Literature is getting to subscribers. Over time, an increasing mis-match of reaching attendees through the school.
	6) Better protected local environment (esp. water and energy resources) and improved quality of life	<ol style="list-style-type: none"> 1. Decrease in CO2 emissions from household use in over 50% of participants 2. Decrease in household water use in over 50% of participants 3. Improved waste management in over 50% of participants 	<p>1. CO2 emissions: NaDEET Centre's increased solar cooking and fuel efficient stoves in 2012, resulted in the centre reducing CO2 output by 35% from 2011. Limited impact among learners as they have little control over household cooking. Most participants still cook with firewood and those who use electricity for lighting now take action to switch off unused lights; Most teachers we met cook on electricity. Some teachers and community members have adopted energy and water-saving techniques.</p> <p>2. NaDEET Centre's water use per participant is ~17 litres/ pers/day. Most learners & participants have changed to use cup, bottle or carton to drink water/wash teeth. 1 educator uses a self-made bucket shower.</p> <p>3. Increased awareness and reduced littering; Few improved options for disposing of waste available - still burn in yard pit and village landfill. Contractors mix all the school-separated waste back together.</p>

Appendix 3 List of people interviewed

NaDEET staff and volunteers	
Name	Position
Viktoria Keding	Director
Andreas Keding	Technical Director
Manuela Schmid	Development Associate
Karley Drumm	Centre Manager
Vilho Absalom	Environmental Educator- Centre
Vicky Endjala	Environmental Educator- Outreach
Elizabeth Lammert	Kitchen Manager
Retatuhe Tjikotoke	Kitchen Manager
Martha Sam	Centre Assistant (intern)
Tobias Thull	Centre Assistant (Weltwaerts volunteer)
Katharina Ebeling	Volunteer

School staff		
Name	Position	Organization
E. P. Londt	Principal	Origo PS
D.V Ferreira	Teacher	Origo PS
D.S. Cloete	Teacher	Origo PS
P. Majiedt	Principal	Witkop PS
E. Beukes	Principal	Oan//ob PS
E.A Uandara	Teacher	Witkrans PS
M.E Amelenge	Teacher	Mariental HS
TM Van Rooyen	Teacher	Mariental HS
Bezuidenhout	Teacher	Anna Maasdorp
R. Khoeses	Teacher	Jacob Saul PS
U. Nganjone	Teacher	Jacob Saul PS
P.I. Fleermuis	Teacher	E. Fredericks PS, Uibis
L. Bontze	Teacher (did not attend)	E. Fredericks PS
E. Gawa!nab	Teacher “	E. Fredericks PS
L. Blokstaan	Teacher “	E. Fredericks PS
F.M.Hanse	Secretary	E. Fredericks PS

Community members reached by NaDEET

Jakob Saul	Deputy Mayor	Stampriet PS
Jacques Coetzee	Youth	Stampriet PS
Veronika Katjikuri	Community member	Maltahöhe
M. Boois	Community member	Uibis
F. Savage	Community member	Uibis
A. Teiseb	Community member	Uibis
A. Garises	Community member	Uibis
Mr P.H. Fleermuis	Community member	Uibis
Irene Mouton	Orange Babies	Rehoboth

Community members in Control Group in Uibis

A. Gariseb		
P.M. Garises		
J. Jagen		
W.C. Matroos		
K. Silama		
G. Garises		
J. Willemina		
H. Kooitjie		
D. Ruadab		
K. Fredericks		
J. Gomachab		
I. Boois		
C. Fredericks		
P. Boois		
H. Pierters		
A. Byl		
F. Hanse		

Appendix 4 Focus Group Discussion Tool for Learners



Ashby Associates cc



Focus Group Discussion Questions for learners who visited NaDEET

“My name is Jennifer Van Wyk and we are conducting an external evaluation of NaDEET’s current 3 year EU funded project: Environmental Education to Empower Namibian Communities to Improve their Living Conditions. Your participation in this evaluation is voluntary. You may choose not to participate and you may withdraw your consent to participate at any time. Your identity will not be revealed to anyone but us.

No-one left the groups and they all signed “I have read this consent form and agree to participate in this survey.”

1. When did you go to NaDEET? Has anyone been to NaDEET before that?
2. What do you remember about NaDEET?
3. Is anything you learnt at NaDEET relevant to your school work? Which subjects?
4. What type of energy do you use at home? (firewood, electricity, other?) Where do you get your water from?
5. Did you apply anything you learnt at NaDEET? – *Probe for changes to your personal life, your family, your community or school environment?*
6. What makes it difficult for you to implement NaDEET’s ideas?
7. Do you want to say or add anything?