An Evaluation of Environmental Education Programs on Pemba Island

Lindsay Kingston

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An Evaluation of Environmental Education Programs on Pemba Island

Lindsay Kingston

Middlebury College

SIT Zanzibar, Tanzania Spring 2013

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Abstract:

Pemba Island, a member of the Zanzibar archipelago, is intimately connected and highly dependent on their natural resources, which are rapidly deteriorating. How to sustain their agrarian-based economy whilst also conserving the environment is the current challenge facing this island. Key to overcoming this dilemma is the development of knowledgeable and effective environmental organizations, such as environmental clubs and NGOs. A small-scale assessment of the environmental education (EE) and associated clubs was established primarily through a student survey, on-site visits, and interviews. It focuses primarily on evaluating three schools and their associated clubs, but also provides information on the Island’s two prominent environmental NGOs. Results indicate that there is inconsistent and under quality EE in schools and that the clubs are not as effective as they should be. This lack of progress is likely due to the limited role of students, poor club administrative structure, lack of creativity and shortage of resources. In order for these clubs to have a greater impact they need to re-allocate club responsibilities to the students, internally restructure, form solid connections with outside sources (NGOs), and diversify their activities. These adjustments will enable clubs to be more effective in educating and engaging both students and community on environmental conservation.

Introduction

I. Environmental issues in Pemba

Tanzania, which includes the semi-autonomous Zanzibar archipelago, off its eastern coast, has a particularly high awareness of environmental degradation as indicated by the development of environmental policy, community-based action (i.e. planting trees), growth of environmental clubs in schools, and the creation of environmental non-governmental organizations (NGOs) (Mbelle, 1994). Their agrarian based economy makes these conservation efforts necessary, but unfortunately, they have not been enough to reverse the rapid destruction of the land and thus the environment continues to decline (Mbelle, 1994).

The lives of all Zanzibari’s are intimately intertwined with the environment and their survival of present and future generations depends on maintaining a “sustainable and harmonious relationship with nature” (Suleiman, 2006). The two main islands, Unguja and Pemba, are both highly dependent on their natural resources and are thus facing similar environmental problems,
such as deforestation, erosion, coral reef degradation, waste management, and a plethora of others (Palmer, 2011). These are in turn causing the severe degradation of land, ocean and societal health. However, Pemba relies much more heavily on their agricultural sector than Unguja, while the latter has been able to rely largely on their lucrative, but environmentally destructive tourism industry (Schmitt, 1996). The economic divergence of these two islands has led to the development of similar environmental initiatives, such as out-of-school clubs and NGOs, but they vary in the issues they focus on and their means of solving them.

Pemba, the smaller of the two main islands (984km$^2$), is facing the acute environmental problems common to most coastal rural areas (Bruyere et al., 2011). Deforestation is the most prominent form of degradation and perpetuates a variety of other problems including erosion, drought and mangrove deterioration (Bruyere et al., 2011). Unfortunately, with wood being the dominant source of energy for the island and used for almost everything from construction to cooking, the cutting down of trees cannot be stopped until alternatives are found (Palmer, 2011). In addition, sand mining, improper fishing techniques and unsustainable agricultural practices contribute to the deteriorating environmental situation.

II. Solutions

Due to the natural interconnectedness of a healthy environment and its ecosystems the problems that arise are also inherently complex. Therefore, the solutions have to be multifaceted and involve all levels of society, including the government, communities and schools. The Zanzibari government has developed and attempted to implement national environmental policies such as, the Forest Reserves Decree, The Wildlife Conservation Act, and The Wood-cutting Decree (Mbelle, 1994). Independent laws have also been created at the various government administrative levels, from regional all the way to the community-based shehias.
However, the enforcement of these laws, at all levels, is where government action has fallen short (Shaibu, Personal Communication). Additionally, only a small amount of central government resources is allocated to rural areas, which has in turn led to the development of grassroots programs and an increase in the level of community-initiated environmental activities (Bruyere et al., 2011).

On the community level environmental NGOs have started to develop as alternatives to governmental aid. Although difficult to sustain in such rural settings and with limited funding and resources, NGOs are finding their communities to be extremely receptive and enthusiastic about their efforts (Haji, Personal Communication). Additionally, as the NGO continues to establish itself and gain rapport within the community, participation in activities and attendance at the informational sessions continue to grow.

The level of community involvement, interest and support plays a vital role in the success of implementing awareness campaigns and more importantly in the incorporation of “informal” EE in schools (GreenCom, 2000). Due to the lack of EE in the education system, extra-curricular programs, such as environmental clubs, have become necessary (Bruyere et al. 2011). Many schools on Pemba have taken action and created environmental clubs to educate and mobilize their students and communities on environmental conservation. It has been shown that environmental clubs not only influence the actual practices of children, but also of parents and the local community (GreenCom, 2000). Although clubs and NGOs are essential, innovative and effective ways to spread knowledge about the environment, they do not eliminate the necessity of EE in the classroom.
The definition of environmental education (EE) has been constantly evolving and redefined over the past three decades and often varies from country to country due to the inherent complexity and constantly changing tendency of the environment. According to the Tanzania National Environment Management Council (NEMC), environmental education is,

“A life-long process whereby individuals and the whole Tanzanian society acquire knowledge, develop ethics and become environmentally aware/conscious, responsive and acquire relevant skills in identifying, managing, monitoring, evaluating and solving environmental issues and problems” (NEMC, 2009).

Zanzibar’s education system is technically independent from mainland Tanzania’s; therefore, development of educational policy falls under the jurisdiction of the Revolutionary Government of Zanzibar (Nyerere M.J.K., 1985). However, the islands have adopted the same definition of EE as well as a strong dedication towards improving EE in schools.

In their 2006 Educational Policy, the Zanzibar government states that, “environmental education curriculum shall be revised, strengthened and monitored so as to instill into the learners knowledge and skills that promote environmental awareness and contribute to sustainable development of their community and the country at large” (Suleiman, H.A. 2006). The policy also recognizes that schools are essential to effectively promoting, encouraging and disseminating environmental education and awareness (Suleiman, H.A. 2006). Simply put, schools provide the essential infrastructure as well as the connections to the local government and community members necessary for the effective spread of EE (GreenCom, 2011).

Quality EE is supposed to be interdisciplinary and action oriented, involving more than one subject area or curriculum focal point (Petegem, 2007). Currently, EE in all of Zanzibar is supposed to be incorporated into language classes, Islamic studies and geography curriculums of both primary (standard I-VII) and secondary schools (Form I-IV) (Suleiman, 2006).
Unfortunately, implementation of EE is a complex and challenging process that opposes the traditional teaching techniques (Kimaryo, 2011). Research has shown that integration of EE into the formal school subjects has been largely unsuccessful because most teachers not only lack the knowledge and skills to teach EE, but are also resistant to the unconventional methods required to teach it properly (Kimaryo, 2011). Although teachers are aware that students learn better through the participatory approach of EE, they view it as too time-consuming and energy intensive as well as an affront to their professionalism (Iskasson, 2006). And with the additional external pressures of large classroom sizes, national examinations and inadequate teaching materials teachers find it easier to revert back to what they now: chalk boards, rote learning, and teaching for the test (Kimaryo, 2011). With EE continuing to grow in importance and necessity, but taking a back seat in the formal classroom, it has found its niche in the extracurricular activities forum, such as clubs and NGOS.

IV. Establishment of Environmental Clubs and NGOS

Extracurricular clubs and NGOs have been growing in prevalence throughout the Zanzibar archipelago (Peters, 2006). They have become vessels for distributing knowledge on topics that are not covered thoroughly in the classrooms, such as environmental education. In theory, these organizations should be forums of empowerment for the youth and community. Clubs in particular should be promoting an in-depth participatory approach that provides opportunities and initiatives to their students that are typically unavailable in the standard education system (GreenCom, 2000). In order for this to happen, the teachers must be willing to take a step back from their traditional, domineering position and act only as a supporting advisor (Isaksson, 2006). Furthermore, students should be given full responsibility of all aspects of the club, including the development of its administrative structure, goals, areas of focus, meetings
and activities. Students’ abilities are often underestimated, but they must be given the opportunity and proper support. When this is done, it has been shown that they not only have the ability to be strong advocates for change, but also to be effective at bringing about tangible progress within their societies.

Environmental NGOs were started by community leaders in the late 1990’s to raise local awareness and knowledge about the growing environmental problems in their specific shehia’s as well as Pemba in general. VECA and WECOC are two examples of NGOs found on Pemba. VECA (Vitongoji Environmental Conservation Association) focuses on, “building a strong and well-equipped society with progressive economic activities and strong awareness of the environmental conservation” (Haji, Personal Communication). Their activities involve planting trees, community-wide environmental educational sessions, and beekeeping. Their newest project is focused on educating women on their land rights and helping them in the process of obtaining their own land. Similarly, WECOC (Wete Environmental Conservation Club) focuses on environmental awareness, maintaining the well-being of the environment and encouraging sustainable development (Omar, Personal Communication). The main difference between the two NGO’s is that WECOC has actively incorporated teachers and students from surrounding schools; whereas, VECA is still working to establish an active link with their local school.

Ultimately, these external initiatives, clubs and NGOs, are examples of the publics growing acknowledgement and concern for the environment’s health and their increased motivation to take action without government aid. Now, the questions becomes how successful are these clubs and NGOs at fulfilling their missions, what are they lacking and what is needed to make them both sustainable and more effective tools for teaching environmental education and initiating conservation efforts.
V. Study Objectives:

This study aims to answer the above question by evaluating the out-of-school environmental education programs on Pemba Island through individual and group interviews, on-site visits, and a written survey. The focus is on establishing an understanding of club structure and function in order to develop recommendations to make them more effective. These EE programs remain an appealing alternative to in-class science education and aid in the Zanzibari governments attempt to reach their long-term goal of an environmentally literate and conscious population. If students and communities continue to feel like they play a pivotal role in these clubs and NGOs, then there is a greater likelihood of them continuing to care and take action, and action, “thrives on the conviction that a cause is important to others and also relevant to ones own life” (GreenCom, 2000).

Study Sites:

Makoongwe Island School–

The school is on Makoongwe Island, a shehia three kilometers off the southwest tip of Pemba (Figure 1, Appendix I). It is about a two hour dallah dallah ride from the Chake Chake district to the port town of Mkoani and from there it is less than a hour dhow ride, depending on the winds and weather, to Makoongwe. It is extremely rural with hilly terrain and no conventional roads. There is no electricity as of two months ago when the generator broke. Originally, the people received their freshwater from a well on the island, but now a pipeline pumps water from Mkoani. The locals build their traditional homes on top of the hills to avoid the high tides and flooding during the rainy season. Crops are grown on the flat lands and consist largely of cassava, banana trees and coconut trees. The main occupation for men is fishing and farming. The women also farm, gather mussels by the shore, and tend to their homes and
children. There is one school for the entire island that goes from nursery to secondary and educates over 500 children. The school grounds are made up of eight buildings in a square configuration: one building for the nursery school, three for primary, two for secondary and two for administrative offices. The schoolyard was largely composed of grass and a single massive mango tree.

_Vitongoji Environmental Conservation Association (VECA) –_

The VECA office is located in the South Pemba Region in the small, rural shehia of Vitongoji (Figure 1, Appendix I). It is a forty-five minute drive east of Chake Chake via dallah dallah. From the final dallah dallah stop take a left hand turn onto a dirt road and the VECA office is about 500 meters down on the right. The one room office building has a sign above it and is equipped with two desks, a working computer, printer, and photocopier.

_Vitongoji Primary and Secondary School –_

The school is also located in the Vitongoji shehia, a quarter kilometer straight down the main road from the final dallah dallah stop and on the left (Figure 1, Appendix I). It is a primary and secondary school, teaching Standards I –VII and Forms I-IV. It has both an environmental and a health club, which are independent from VECA. School had a similar block configuration to Makoongwe with Primary school buildings on one side, Secondary school buildings on the other and two administrative buildings for the head master and teachers. The buildings surround the central grounds, which were grassy and appeared well kept with a number of trees and small gardens.
Wete Environmental Conservation Club (WECOC) –

WECOC is located in the Jadida shehia, in Wete district, in the North Pemba Region (Figure 1, Appendix I). It is an hour and a half north of Chake Chake via dallah dallah. The WECOC office can be found on the left along the main road from Chake Chake about one kilometer from the final dallah dallah stop. The office consists of two rooms with a working computer, printer and photocopier. It is located next to another NGO named the Pemba Women’s Development Organization.

Limbani Secondary School –

The school is located in the Limbani shehia within the Wete district (Figure 1, Appendix I). Coming from Chake Chake it is on the right about four kilometers from the WECOC office. It is in a secluded, suburban area about a five-minute walk from the main road and educates only secondary students Forms I-IV. It has a similar layout as both Makoongwe and Vitongoji with all the buildings oriented in a square enclosing a small green. The grassy grounds have a number of gardens and trees. A circle of tables used predominantly by teachers during breaks and for staff meetings occupies the shade under the schoolyard’s central trees.

Methodology:

Over a two-week period the environmental activity and environmental club structure of three schools and two non-governmental organizations (NGO) based in the north, central and southern regions of Pemba Island were evaluated through a combination of observed science classes, individual interviews, group interviews, and a five-question survey (Appendix II, III). Students were given an initial thirty minutes plus any additional time needed to complete the survey. They were allowed to answer in either English or Kiswahili. Volunteer participants
included students, science teachers, club advisors, NGO secretaries, shehas and community members (Appendix IV). A standard set of questions specific to the interviewee’s status was formulated to determine interviewee’s personal motivation, basic understanding of environment, and level of knowledge and involvement in the present environmental program (Appendix III). However, additional questions were asked if there was need for clarification or elaboration on the initial responses. All interviews were conducted in English or Kiswahili, per individual participants request.

*Makoongwe Island:*

At the Makoongwe Primary and Secondary School an initial interview conducted in English with the club advisor, Ali Yussef, aimed at gathering general information on the environmental club, such as its structure, mission, goals, activities, and challenges (Table 1). An individual interview with the biology teacher, Zahor Khamis, was performed in English, using the teacher-specific questions. Surveys were handed out to 28 secondary students (12 males and 16 females) chosen by the club advisor. The students completed the survey with no person of authority present. From the survey group the advising teacher chose six students, three males and three females, to be interviewed one-on-one. Interviews were conducted in the main office and in the student’s language of choice. The translator and club advisor were both present. Additionally, a forty-five minute biology lesson on Ecosystems was observed during the school visit.

Community interviews were conducted in a classroom at the school with all participants present for the entirety of the session. A total of 20 community members, eleven women and nine men, were all asked the same set of community-specific questions in either English or Kiswahili, per interviewee(s) request. Women and men were interviewed separately and in pairs or small groups of no more than four individuals. Although individuals were chosen arbitrarily,
they all volunteered and had some preliminary interest or investment in the environment. A second more formal interview was performed with a government fishing, processing and marketing officer, Shaibu, after his participation in the community interview session. Unfortunately, the sheha was unavailable at the time and was unable to be interviewed.

**Vitongoji Shehia—**

Similarly to the Makoongwe School, a preliminary interview with the Vitongoji School’s Environmental club advisor, Saidi Omar Said, who was also the Standard VII biology and social science teacher, was conducted to obtain general information on the club. Surveys were given to a total of 31 students (15 females and 16 males) from both the primary and secondary school and all are members of the club. From the surveyed students, three males and three females were chosen by the advisor to be asked additional questions one-on-one. The club advisor and translator were present during individual interviews and the students were given their language preference between English or Kiswahili. No other science teachers were available for interviews and science classes were done for the day. A casual interview with a graduated, ex-club member, Ali Shaibu, was conducted. He was asked a combination of questions from the student and community member question sets to determine level of environmental knowledge and activity post-secondary school.

The community interviews took place in the sheha’s office and were in the form of an informal discussion that predominately focused on VECA. Six women and five men, who all actively participate in VECA, contributed to the interview session. The Vitongoji sheha, Salum Ayuba Suleiman, was interviewed after the group discussion. All interviews conducted were in Kiswahili. Ali Saidi, a part-time employee for VECA, and Sifuni, VECA’s secretary, were also interviewed for general information about the NGO.
Wete District (Limbani and Jidani shehia) –

At the Limbani Secondary School the biology teacher named Aflah was interviewed and observed teaching a biology class on “Waste and Waste Disposal”. A total of 29 students (16 females and 13 males) were given the survey and from that group three boys and three girls volunteered to participate in the interview session. Student interviews were conducted as a group discussion without any teachers or translators present and in a mixture of English and Kiswahili. The standard student questions were modified slightly due to the school not having a formal environmental club. Additional questions inquiring about participation, activities, club goals and students roles, were added to establish the level of interest in creating a club.

Community interviews were conducted at the WECOC office with one male WECOC members and two women who are members of Pemba Women’s Development Organization and who participate in WECOC activities. All were done in Kiswahili and by gender. The sheha, Juma Mrisha, was also interviewed at his shop in town. Two additional interviews were performed to gather general information on the NGO with Teacher Omar, the WECOC secretary, and Ali Ahmed, the proposal writer (Table 1). Teacher Omar also teaches at Limbani Secondary School and acts as the liaison between the school and the club.

Limitations:

Several limitations exist within the field of this study that may have influenced the results and thus make them less reliable. First, consistent methodology, especially with the number of interviewees from each group, would have ideally been applied to each school and NGO. Due to participant availability and time restraints the number of interviews and surveys varied from site to site. In particular, the sites with fewer community interviews may not accurately illustrate the
opinions, understanding and knowledge of the community. Also, without having observed any club meetings or activities, due to their infrequency, it is difficult to judge club effectiveness accurately and conclusions have to be drawn solely from the interview and survey responses.

Secondly, Kiswahili was the primary language of interviews and all survey responses. Often times there is no direct translations from Kiswahili to English; therefore, misinterpretation and/or mistranslation of responses may have occurred. Thirdly, the goal was to conduct all interviews individually. However, there were a number of times where pair and group interviews were more appropriate and conducive to the situation. Unfortunately, in this setting some students flourished and others drew back and allowed the more outgoing individuals to answer most of the questions. When this occurred, questions were directed to the quieter individuals first to try and get them engaged before the leaders jumped in, but results may still be skewed.

Lastly, the presence of authority figures, particularly of teachers during student interviews, may have affected how interviewees responded as well as the content of their answers. To try and offset this, the written surveys were filled out with only the translator present to answer any clarifying questions.

Results

1. Environmental Clubs and NGO General characteristics

Details of the clubs and NGOs studied was synthesized and put in Table 1. (Appendix V). It provides the background information necessary for understanding and evaluating student and community responses. The Limbani School was not included because it has no formal environmental club established. Of note is the infrequency of club/NGO meetings and informational sessions across all four organizations as well as the homogeneity of their missions and all their activities (planting trees, educating community and raising awareness).
Table 2. synthesizes student responses to numerous questions about their environmental club. Of note is the universal response of “planting trees” to question 1a. “What kind of activities do you do?” Additionally, 8 of the 12 students stated that they “loved or liked” the environment as their reason for being a club member.

Table 2. Individual student interview responses to question 1a-d “Tell me about your environmental club?” Only Makoongwe (M) and Vitongoji (V) student answers are recorded. The Limbani School did not have a club so this question was removed from the interview. In the grade column SD = standard (primary school and F = form (secondary). Makoongwe students were all in secondary school but specific Form level was not recorded.

<table>
<thead>
<tr>
<th>Student</th>
<th>Gender</th>
<th>Grade</th>
<th>Q1a. What kind of activities do you do?</th>
<th>Q1b. What are the clubs goals?</th>
<th>Q1c. Why are you a member?</th>
<th>Q1d. What do you do during club meetings?</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1</td>
<td>M</td>
<td>F</td>
<td>- Plant trees</td>
<td>- Educate villagers</td>
<td>- Loves environment</td>
<td>- Share ideas about environmental issues</td>
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<td></td>
<td></td>
<td></td>
<td>- Protect pemba flying fox</td>
<td>- Make island sustainable</td>
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<td></td>
<td></td>
<td></td>
<td>- Clean beach</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M2</td>
<td>M</td>
<td>F</td>
<td>- Plant trees</td>
<td>- To plant trees to avoid</td>
<td>- Likes the environment</td>
<td>- Get knowledge about environmental</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>erosion</td>
<td></td>
<td>problems</td>
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<tr>
<td>M3</td>
<td>M</td>
<td>F</td>
<td>- Plant trees</td>
<td>- To plant trees to avoid</td>
<td>- Loves the environment</td>
<td>- Talk about importance of environment</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>erosion</td>
<td></td>
<td></td>
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<tr>
<td>M4</td>
<td>F</td>
<td>F</td>
<td>- Plant trees</td>
<td>- To protect the environment</td>
<td>- Loves the environment</td>
<td>- Give education to community</td>
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<td></td>
<td></td>
<td></td>
<td>- Protect coral reefs</td>
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<td></td>
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<tr>
<td>M5</td>
<td>F</td>
<td>F</td>
<td>- Plant trees</td>
<td>- To avoid erosion</td>
<td>- Likes the environment</td>
<td>- No answer</td>
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<tr>
<td>M6</td>
<td>F</td>
<td>F</td>
<td>- Plant trees</td>
<td>- To avoid erosion</td>
<td>- Likes the environment</td>
<td>- Talk about island environment</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- She is a student</td>
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<tr>
<td>V1</td>
<td>M</td>
<td>F-I</td>
<td>- Plant trees</td>
<td>- To make a good, clean</td>
<td>- Involved in environmental activity</td>
<td></td>
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<td></td>
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<td>environment</td>
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<td></td>
<td>- Get education on how to</td>
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<td>clean environment</td>
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<td></td>
<td>- Educate together on the</td>
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<td>importance of planting</td>
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<td></td>
<td></td>
<td></td>
<td>trees</td>
<td></td>
</tr>
<tr>
<td>V2</td>
<td>M</td>
<td>SD-VI</td>
<td>- Plant trees</td>
<td>- To change the environment</td>
<td>- Decided himself to be a</td>
<td></td>
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<td>member</td>
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<td></td>
<td></td>
<td>- To educate together how</td>
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<td></td>
<td></td>
<td></td>
<td>to conserve the environment and plant trees</td>
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</tr>
<tr>
<td>V3</td>
<td>M</td>
<td>SD-VI</td>
<td>- Plant trees</td>
<td>- To educate society</td>
<td>- Interested in environment</td>
<td></td>
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<td>- Chosen by advising</td>
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<td></td>
<td></td>
<td></td>
<td>- To keep environment clean</td>
<td>teacher</td>
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<td></td>
<td></td>
<td></td>
<td>- Be educated on how to</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>plant trees and conserve</td>
<td></td>
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<tr>
<td>V4</td>
<td>F</td>
<td>F-I</td>
<td>- Plant trees</td>
<td>- To give education to others.</td>
<td>- Likes to conserve</td>
<td>- Learn how to have good health</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>- Reduce diseases</td>
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<tr>
<td>V5</td>
<td>F</td>
<td>SD-VI</td>
<td>- Plant trees</td>
<td>- To conserve environment</td>
<td>- Chosen by advising</td>
<td>- Discuss about the way to</td>
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<td>arise/occur</td>
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<td>V6</td>
<td>F</td>
<td>F-III</td>
<td>- Plant trees</td>
<td>- To build a good environment for better life</td>
<td>- Loves the club and environment</td>
<td>- To get education</td>
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</table>
II. Observations of biology classes

At the Makoongwe Island School the secondary biology class, which included a mixture of students from all Forms, lasted 45 minutes and was delivered predominantly in English. Kiswahili was used sporadically if the teacher was unable to come up with a word or describe the concept properly in English. The lecture topic was “Ecosystems”. The teacher talked the entire class using both verbal repetition and the chalkboard to write down everything he said. He also consistently used a small notebook on his desk for reference. The content of the lecture included defining terms, such as ecosystem, natural environment, biotic and abiotic factors, population, community, food webs and food chains. For example, natural environment was defined as, “involved interaction between living and non-living things to sustain environment”. Examples were provided for biotic and abiotic factors. Additional diagrams were drawn for both the food web and chain and live animal representations were brought in to illustrate the various components of a food chain (Appendix VI).

Student involvement was minimal throughout the lecture and only seven students were actively taking notes. The teacher occasionally attempted to engage his students by asking them to provide definitions or examples. During these instances, it was rare for students to willingly raise their hands. Thus, when no one volunteered the teacher either targeted a student directly, which often resulted in silence, or he would answer the question himself.

The biology class at Limbani Secondary School was much different from Makoongwe, not only in content, but also in teaching technique, teacher enthusiasm and student involvement. The lecture was on “Waste and Waste Disposal”. It involved defining and giving examples of waste, waste disposal, degradable, biodegradable, types of waste and different sources of waste. Teacher Aflah taught from memory and used the chalkboard for writing the simplified version of
what he was saying and for the examples provided by the students. The lesson was taught in both Kiswahili and English. He would start in English and then restate or explain again in Kiswahili to ensure students full comprehension. Teacher Aflah teaches other environmental topic in his biology class including, the “balance of nature”, pollution, soil erosion. In his chemistry class energy and fuel, soil chemistry and pollutants are the environmental subjects covered.

In general the class had a conversational structure, was much more interactive than the one in Makoongwe, and the students were always engaged in some form. Teacher Aflah asked questions constantly and wrote down every response. He then proceeded to go back through them and explain why each one was correct or incorrect. In addition, he had the students break off into four groups to brainstorm and report back to the whole class examples of the types of wastes found in different environments (i.e. homes, schools, industries, hospitals).

Teacher Aflah was knowledgeable and passionate about the subject. His good relationship with his students, who were exceedingly more outgoing than any of the others previous interviewed, was evident. They willingly and actively participated throughout the class.

**III. Student written surveys**

In general, most students provided only simple one-sentence answers and rarely elaborated. Every single student responded in Kiswahili and asked to remain anonymous. Student responses to the five questions varied between schools, but within each school responses tended to be fairly homogenous, with multiple surveys having close to identical answers.

In the first question, “what does environment mean to you?” the majority of all student responses (65%) mentioned benefits humans receive from the environment, such as life, personal health, clean living areas, and prevention of diseases (Figure 2). Common phrases such as “gives good health”, “cannot live without”, “is the place that we live” and “gives us many things” were
repeated by multiple students at each school. Additionally, only about 12% of students provided any ecological reasoning (i.e. prevents erosion, brings rain, and protects animals) for why the environment is important and the majority of those response came from the Makoongwe students.

![Bar chart showing student responses to survey question 1.](Figure 2)

Figure 2. Student responses to survey question 1. "What does environment mean to you?. If students gave multiple answers that fell into different categories, each was tallied separately. Category "gives humans many things" includes life, knowledge, healthy, source of income. Category "ecological reasons" includes stops erosion, protect animals, conserves land.

For question two, 82% of students described a club as either “a tool that brings together community members to conserve environment” or as “a particular group that does specific activities” (Figure 3).
When compared to the club’s “official” goals, which were provided by the club advisor (Table 1), student answers had at least one or a portion of their clubs goals included. Students from all three schools, Makoongwe students especially, were most readily able to identify the goals that were based on acts of conservation (i.e. Protecting the Pemba Flying Fox). The majority of answers were very unspecific with the second most common statement after “acts of conservation” being “to improve the environment” (Figure 4). All the clubs and NGOs had “the education of people” within their goals, but only 21 student responses included it. Also every club had the concept of sustainability incorporated into their goals, yet only five student responses mentioned the word. Although Limbani did not have a formal school club, all the students responded to the question in reference to their involvement with and knowledge about WECOC and reflected a similar level of understanding as the other students.
Question four provided an instance where responses within each school were very similar, but between the three schools the dominant answer varied (Figure 5). The question asked students to describe what they had learned in school about the environment. At Makoongwe 44% of students said that they were taught, “to consider the environment in order to benefit now and future generations”; 32% of Vitongoji students said, “I have learned to clean the environment” or some variation of that and 60% of Limbani student responses described some version of conserving, preserving or caring for the environment. This was an example of a common trend that was most prominent in this particular question, but was found throughout the other survey questions as well.
Responses to question five showed that the majority of students believed that further education and training, proper equipment, and money were the resources and information they needed to be able to run an environmental club effectively. Only 16 students did not include any of the latter top three resources in their answers (Figure 6).

Figure 5. Comparison of student responses to survey question 4. "What have you been taught about the environment in school?" between the three study schools. If students gave multiple answers that fell into different categories, each was tallied separately.
There were also noteworthy responses from various students. One student from Limbani wrote that he has learned “self-confidence and self-understanding in himself and in doing environmental activities”. Three other students, two from Vitongoji and one from Makoongwe, said that they wanted education and training on how to run a club properly and “develop good goals”. Other than the few unique responses the surveys were fairly uniform, especially within the specific schools.

**IV. Student interviews**

Similarly to the written survey, students participating in the individual interviews preferred to remain anonymous. Their responses were broad and simple and most students, especially the girls, at all three schools were shy and awkward during their interviews. This made the process much more formal than anticipated. In addition, every student requested their interview to be conducted in Kiswahili, except during the Limbani group interview where the
students said that a combination of Kiswahili and English could be used so that the teacher didn’t have to be present.

The environmental problems identified in the student interviews varied between schools with only slight overlap. The Makoongwe students said that their main problems were soil erosion, cutting trees, and decreasing rain. Vitongoji students said ignorance, disease and not enough EE. Limbani students talked primarily about the problem of communicable diseases such as cholera and malaria.

In association with communicable disease being a problem, the Limbani students cited prevention of those diseases as the reason for why they would want to start an environmental club. The Makoongwe and Vitongoji student responses to “why are you interested in the environment” ranged from reasons involving its benefits to humans to its importance to life in general. Examples of common responses were “the environment is important”, “I love the environment” and “it gives me many advantages and benefits.

When asked about the administrative setup of their club, the Makoongwe students only identified the teacher’s position as being that of advisor, organizer and educator. The student’s role was solely to participate in the environmental activities organized by the advising teacher and attend the educational information sessions. There was no mention of students having any involvement in the actual management of the club. The Vitongoji club members were able to provide a jumbled, but general outline of their clubs structure, which included a teaching advisor and a student chairman, secretary and kesha (treasurer). None of the students identified all four positions. Students only gave two or three and were unable to elaborate further on what the responsibilities of the positions actually entailed.
In short, responses to “what do you think would make the club better?” were the same three across all three schools: more money, better equipment and more education. These were also the same three dominant answers from question five on the survey that asked what resources are needed for students to run a club?

When asked, “what is the most important thing you have learned from the club?” the most common answers were “to plant trees”, “to educate society”, “to keep environment clean” and “to avoid diseases”. The responses to the follow up question, “what is something you want to learn about the environment” were mainly about learning how to educate society and how to protect and manage certain aspects of the environment, such as trees, coral, and animals.

Due to Limbani not having a formal school club, the students responded to questions asking about a hypothetical club of their creation. All six students said they would participate in an environmental club. They said they would want the goal of their club to be to educate people about the advantages of environment and on the application of proper waste disposal. The activities brainstormed included planting trees, burning of trash and “to reduce and recycle”. The students described their role in the club to be as participants and to clean the environment. When asked who would run the club, their initial answer was the teacher. Then, when asked if they thought students would be able to organize the club themselves there was a unanimous agreement of yes, but no further elaboration or reasoning was given. There was very little mention of WECOC and when questioned about their involvement the students said that they participate in the activities when Teacher Omar tells them to.

V. Community and Sheha interviews

In general, the knowledge level about the environment was very basic and answers generic across all three communities. Behavior of the women at all three sites reflected the
behavior of the female students during their interviews: shy and soft-spoken. The men tended to be more outgoing and willing to elaborate on their answers. The generic response from all three sessions to the question “what does environment mean to you?” was, “the environment is everything that surrounds us” or “is a part of all things”. All interviewees from the three communities participated in their club or NGO activities, except for three individuals in Makoongwe. Two were men and had been members while in school, but were no longer involved and one woman said that the club does not involve all villagers.

When asked about the major environmental problems facing their communities the cutting of trees, soil erosion and lack of good environmental education were the ones that overlapped in all three (Figure 7). Figure 7 shows the wide spectrum of responses and the most frequently identified environmental problems across all community members, additional interviewees and teachers.

![Figure 7. Responses to "What is the greatest environmental problem in your community?" from community members, additional interviewees and teachers. If interviewees gave multiple answers that fell into different categories, each was tallied separately.](image-url)
During the Vitongoji group interview communicable diseases was the unique response. In Makoongwe, poverty, the discarding of fish remnants into the ocean, and dumping of emptied shells over the embankments were specifically addressed. Responses to “what would make the club better” were money, proper tools, and more education on the environment. The only specific response came from a women’s group in Makoongwe and they described the need for a club office where meetings could be held and visitors could stay.

When asked, “what is the most important thing you have learned from the club?” responses varied, but all incorporated some act of protecting and conserving a part of the environment (i.e. coral, Pemba Flying Fox, trees, erosion). Other answers included learning “to avoid cutting trees without any goals” and “how to use good fishing nets and farm oysters”. The follow up question that asked what more the respondents wanted to learn about the environment produced a standard response of “more education”. There were unique responses from both men and women at Makoongwe, such as the want to exchange knowledge between other villages and clubs in order to learn the different ways other communities protect the environment. The men were particularly interested in learning more about modern, eco-friendly fishing techniques and ways to effectively protect the coral reefs.

Both the Vitongoji and Wete Sheha’s cited general environmental laws created by the Zanzibari government. When asked about individual shehia laws both Sheha’s said that there were some in effect, but did not elaborate on any specifically. Vitongoji sheha did mention that the Chake Chake district police did enforce the law. The Wete Sheha was the only person, other than the Limbani biology teacher, to identify trash, waste management and sanitation as being the major environmental issues in the community.
VI. Teacher/advisor and additional interviews:

For the question “what does environment mean to you” both Makoongwe teachers (club advisor, Ali Yussef and biology teacher, Zahor Khamis) and the Vitongoji biology teacher, Saidi Omar Said, gave the answer “the environment is what surrounds us”. The Limbani teacher, Aflah, elaborated a little more with “the environment is a place composed of all living and non-living things”.

When asked, “what is the most important environmental problem in the community?” all four teachers stated deforestation as a major environmental problem. Each teacher also gave one or two additional problems that varied between the three shehia’s and the Makoongwe teachers also responded with erosion, poor cultivation and burning of trash. The Vitongoji teacher said that there is not enough rainfall and the Limbani teacher cited waste disposal.

All the teachers said that they try to take their students to visit different places in the environment such as Ngezi Forest and Misali Island, but that financial limitations makes these excursions rare events. The only teacher who mentioned taking students on fieldtrips to poorly managed environments within the schools community was Teacher Aflah who brings his Form II class to local waste dump sites.

The additional interviewee responses were much more robust than the responses of the average community member. The Pemba government Fishing, Processing and Marketing officer, Shaibu, describe the environment as a “chain of life” and that “everyone should know environment because we need it to survive”. The example he gave was, with no trees there would be no oxygen and with no oxygen, there would be no food and no water and thus the land would become desert. He also gave the same environmental problems as most of the other Makoongwe community members: erosion, deforestation and destruction of coral. He wants to gain more
knowledge about the environment in order to “get a diverse number of ideas” on how to conserve.

In a casual interview with Ali Shaibu, a 28 year old who just finished secondary school, who was a member of the school’s environmental club, and is currently waiting for his exam results to continue his education, described the student’s role as a liaison between school and family. He said that students should bring home the environmental awareness being taught by the club and discuss it with their parents. He identified the greatest environmental problems as disease from stagnant water (especially during rainy season), shortage of rain, soil erosion, and land degradation. Also mentioned was the act of cutting trees “without goals [purpose]”.

Mr. Ali Ahmed, WECOC’s proposal writer saw deforestation as the greatest environmental problem and believes additional education, especially for WECOC workers, is necessary for “capacity building”. When asked to elaborate on the latter statement, he described it as improving workers understanding of the environment so that they can more effectively spread information to the community.

Discussion:

Results indicate that although environmental awareness was present throughout communities and schools on Pemba, environmental education in the classroom and clubs was still very limited. This “lack of education” and call for “more education” on the environment has not only been openly acknowledged by the Zanzibar government in their educational policy, but was also the principal response from study participants (Figure 5) (Suleiman, 2012). Even the prominent community leaders, (teachers and shehas) were identifying “poor education” as a major problem. This is concerning considering they are the individuals imperative to the dissemination and implementation of information to the community.
Unfortunately, this overall lack of EE stems from there not being enough people adequately trained in quality EE. Observations of the two biology classes provided a glimpse of the average teachers struggle to incorporate the unconventional EE methods into an already rigid, overloaded, exam-based educational system (Semali, 2012). Even though teachers have been encouraged to make their subjects more applicable to their student’s local environment and culture, this digression from the standard curricula is extremely challenging for the average teacher (Semali, 2012).

EE is supposed to be a multidimensional process that not only teaches about the environment, but also in, through and for the environment. This means that students are taught to understand the environment, then how to interact with it through hands-on experience, and finally how to value and take action to sustain it (Kimaryo, 2011). Considering, how basic the interview responses were when asking about the environment and how standardized the literature claims education to be, both observed biology classes were less traditional than anticipated. Even though, classes were based around a single environmental topic and the chalkboard was the predominant teaching tool, both teachers employed alternative teaching methods. The next time Teacher Zahor Khamis from Makoongwe asks his students to explain what a food chain is, they will be reminded not only of the diagram he drew on the chalkboard, but of the live grasshopper and chicken he brought to class. Live examples and discussion groups added a feature to the classes that were both memorable and engaging for students (Appendix VI).

Although, neither of the biology teachers from Makoongwe or Limbani employed all three dimensions of EE (about, in/through and for) in their lectures, they did incorporate some interactive techniques. How often these teaching techniques are employed and whole classes on the environment taught is a factor that cannot be determined from the results of this study.
However, from individual teacher interviews it was gathered that instead of full subject integration, EE was taught topic by topic with only the most universal ones covered (i.e. pollution, climate change, waste). This superficial treatment of EE components tends to occur when teachers feel overloaded and ill-equipped to teach EE (Kimaryo, 2011). Although, the literature describes a reluctance from teachers to deviate from the traditional teaching methods, those interviewed in this study seemed to struggle more with how to incorporate EE into their everyday lectures.

In addition, students are crucial participants and stakeholders in the implementation of quality EE. Thus, their engagement and energy is required in order to support the innovational thinking needed for truly effective EE (Petegam, 2007). Observations of student behavior showed drastically different levels of interest, enthusiasm, and participation between the two biology classes. The Makoongwe student’s body language made it clear that they were either bored, confused or both. Also, their reluctance to answer questions posed by the teacher, indicated their extreme discomfort in the classroom setting. The Limbani students, on the other hand were extremely responsive and engaged throughout the entire class. All of them took notes and there was never a shortage of hands when a question was asked. These disparities were likely a reflection of the contrasting attitudes of the two teachers.

Teacher Khamis had a much more authoritative presence and maintained a condescending tone throughout the class and individual interview. In contrast, the Limbani teacher was dynamic, engaging and easily approachable, which made the classroom environment conducive to student participation. In addition to the imperativeness of attitude, the competence of a teacher is crucial for the effective transmission of knowledge (Isaksson, 2006). While the Limbani teacher taught his lecture from memory and kept eye contact with his students, the
Makoongwe teacher faced the chalkboard for the majority of the time and was constantly referring to his notebook throughout the class.

Ultimately, the results illustrate that EE is not being consistently or effectively implemented in the Pemba education curriculum. For EE to be integrated into the classroom effectively, students have to feel comfortable taking risks and participating in front of each other and the teacher. And although, both teachers did employ alternative teaching methods during their lectures, the effect their different personalities had on the student’s interest levels and attitudes highlighted one of the major blockades preventing the integration of EE. To circumvent the traditional school structure and some of the shortcomings of in-school EE, extra-curricular alternatives, such as environmental clubs have been initiated by teachers and students.

These environmental clubs have the potential to be effective sources of environmental education for students, but they are lacking in a number of fundamental areas. First and foremost is the limited role students currently have in running clubs as well as in NGOs. Although, the surveys indicated that students understood what a club was, when asked further questions about their personal role, it was apparent that they had limited understanding of how integral they could be to the effectiveness of the club. The Makoongwe club was completely teacher driven, while the Vitongoji club was the only one with students in a position of power. Additionally, it wasn’t until asked if they would want to run the club that the Limbani students thought to include themselves as more than just members. School clubs are supposed to be student oriented and organized. Studies have shown that students are one of the most effective modes of spreading and bringing about perceptible change (GreenCom, 2000).

Student involvement in the two NGO’s is also minimal. WECOC supposedly has small discussion groups composed of teachers, students and community members as well as a teacher
liaison from every school in Wete. However, it was unclear from the interviews what the purpose of these groups are and how often they meet. Additionally, VECA has the future hope of joining forces with Vitongoji school club, but as of right now they have no direct student involvement.

Secondly, in coordination with minimal student control, poor club administrative structure has been detrimental to their success. The Vitongoji club was the only one with any internal organization and it was not until after all of the student and advising teacher interviews that a full understanding of its structure was established. Also, even with three of the four positions run by students, the students interviewed still struggled to describe the responsibilities associated with each position. For any organization to function effectively and smoothly, even on the most rudimentary level, a basic structure with job-specific positions is needed.

Thirdly, the lack of creativity, especially in the activities performed by clubs, has severely hindered their effectiveness. When compared to SIT student, Harrison Schmitt’s, research on the environmental education programs on Pemba from 1996, it seems as if there has been little progression in clubs fulfilling their missions and goals. This is likely due to the fact that the clubs goals are extremely broad and unspecific, which makes measuring the effect and success rate of the club activities very difficult (Table 1).

The Chumbe Environmental Education Program reports that the most common challenge facing clubs on Unguja is in the development of their activities (Peters, 2006). With Pemba having even less access to supportive resources than Unguja, it is not surprising that this is also a major problem for the Pemba clubs as well. Support for the latter statement is clearly seen in the narrowness of activities identified by the majority of participants, which had planting tress as the only specific activity identified by students (Table 2). Any of the others mentioned were just broad, unspecific statements, such as “to clean” or “to protect” different aspects of the
environment (Table 2). This limited repertoire of activities not only makes the clubs less effective, but also halts their development and fails to excite or motivate students to actively participate. Additionally, results indicate that developing new activities is not as much of a concern to the clubs as getting the resources needed to continue their existing activities (Figure 6).

Finally, lack of money, proper equipment and quality education make it extremely difficult for clubs to run smoothly (Issakson, 2006). These were also the top three resources identified by study participants when asked, “What resources are needed for the club to be better?” (Figure 6). In particular, inconsistent funding was seen as a major problem by club advisors and community members because it inhibited them from initiating club activities. Quality education is the most debilitating of the three resources needed because it is the foundation of creating a motivated and progressive society. Although money and equipment are important resources, they should not be of top priority. With a strong internal structure, a little creativity and dedicated club members, the club itself has the ability to generate those resources.

In order for the Pemba clubs to become more effective numerous steps have to be taken, including the re-allocation of club responsibilities to the students, internal restructuring, forming connections with outside sources (NGOs), and diversification of activities. As mentioned previously, students need to be given greater roles in the club administration. For this to happen teachers and students need to recognize and openly acknowledge the student’s potential to be leaders within their schools and communities. They have to believe that they are effective in raising community awareness and in changing the behaviors of those around them (GreenCom, 2000). Once that realization occurs and students discover that they are not only being taken seriously, but truly making a difference they will be further motivated to see their goals through.
Studies have shown that with the proper resources, direction and trust from the adults around them, students feel a sense of empowerment, which can then translate into the power to actualize change in all realms of society (Palmer, 2011). Ultimately, the underlying aim of increasing student roles in clubs is to enhance their sense of responsibility and investment in something so that they will want to be active and innovative in seeking solutions to improving their well-being.

Internal restructuring is another necessary step all three clubs need to take the time to do in order to broaden their influence and function efficiently. Restructuring includes, defining the different positions of authority within the club, establishing a clear mission, and developing realistic long and short-term goals. Of particular importance is goal setting because goals are the heart of any club. They give purpose to the whole entity and provide a center focal point for meetings and activities to be organized around. Ultimately, this stage entails developing a clear plan of action with specific steps that lead to reaching attainable goals.

Connection with outside sources within the community has been found to greatly improve club effectiveness and survival (GreenCom, 2000). If a strong relationship is forged between a school and local NGO it can be extremely beneficial to both organizations. While the NGOs gain easy access to a large amount of youthful enthusiasm, the schools gain outside resources and opportunities, such as scholarship and internships. Together, the programs have the ability to influence a much broader spectrum of people. In Pemba, WECOC is in the unique position of having established connections with a number of local schools, including those without formal environmental clubs, like Limbani. This provides an ideal opportunity for WECOC to help build a new student-run club from the ground up. As the most advanced organization of the ones studied, VECA also has the potential to have a positive effect on their local schools. Although, they have yet to incorporate students into their activities, the VECA
secretary made it clear that building a strong relationship with Vitongoji students was a top priority for the club (Haji, Personal Communication). As WECOC and VECA continue to develop, so will their ability to be a supportive role model for student initiatives.

Finally, club activities should do more than just conserve the environment. They should educate and raise awareness in a way that incorporates all other dimensions of society: social political and economical. Furthermore, activities should be developed and pursued with the intention of advancing the club in the direction of achieving their goals. The Pemba school clubs should look towards VECA as a role model when designing activities. Although, most of VECA’s projects are still in their fledgling stages, they do attempt to reach into the various dimensions of society and are unique alternatives to the standard act of planting trees. An example of this is their program that specifically targets women and helps them to understand and gain their rights to own land (Table1). Additionally, activities can also provide a source of income for a club if performed properly. Again, VECA has used the natural resources available to them and created a beekeeping project that is run by community members and generates income for their club. Ultimately, It takes time and some creativity to develop projects like the ones VECA has started, but diversification of activities is essential to club success.

**Conclusion:**

Environmental degradation of the land and ocean is still occurring rapidly on Pemba Island. Although, the overall results of this study indicate that there is a basic understanding and awareness about these major environmental problems, it also indicates that progression in environmental conservation has slowed considerably. This can be attributed to the limited role of students within the clubs, lack of administrative structure, lack of creativity in activities, and
shortage of resources (money, equipment and education). Additionally, formal environmental education is only present sporadically throughout the school curriculum and teachers are still working to incorporate the most basic topics of EE and hands-on methods into their classes.

Environmental clubs have been created to try and supplement this minimal in-school EE, raise awareness about local environmental problems and encourage acts of environmental conservation. Clubs should be multidimensional and educate about all aspects of the environment, while also fostering creativity and executing effective action towards achieving feasible goals. Although currently struggling, through encouraging student leadership within the club, restructuring, forging connections within their communities, and diversifying their activities, these clubs have the potential to empower students, ignite behavioral change within communities and ameliorate their environment.

**Recommendations:**

It is clear from this study that the initiative for environmental clubs and improving environmental education is there, but that clubs lack the ingenuity and know-how to be truly effective in both schools and communities. Due to this study being a general evaluation of the environmental clubs on Pemba it was able to highlight areas for potential future research. One possibility is to work intimately with one environmental club or NGO to help them identify exactly where and what they are lacking and then work with them to develop ways to solve those deficiencies. Another idea is to help start an environmental club at the Limbani Secondary school or work with VECA to develop ways to connect with the Vitongoji School’s environmental club. A final possibility is to perform a more in depth assessment of the environmental education occurring in the classroom and then put on a set of workshops for the teachers to help them learn the various EE techniques.
Works Cited


Shaibu, Khamis Uleid. Interview. Government Fishing, Processing & Marketing Officer. Makoongwe, Pemba. 1 April, 2013. 10:30am.


Appendix II.

Student Interview Questions
1. Tell me about your environmental club.
   - Tafadhali elezea klabu yako?
   a. What kind of activities do you do?
      - Muna fanya shughuli gani?
   b. What are the clubs goals?
      - Nitajea malengo ya klabu?
   c. Why are you a member?
      - Kwa nini wewe ni mwanachama wa klabu?
   d. What do you do during club meetings?
      - Unafanya nini katika mikutano ya klabu?
2. How is your club set up?
   - Nitajie muundo wa uongozi wa klabu?
3. Tell me about the environmental problems in your community?
   - Nimatatizo yapi ya mazingira katika kijiji chako?
4. What does environment mean to you?
   - Nini unafahamu mazingira?
5. Why are you interested in the environment?
   - Kwa nini unapenda kuhifazi mazingira?
6. What is one thing you think will make the club better?
   - Jambo gani unalofikiria kuwa litaweka klabu vizuri?
7. What is the most important thing you have learned from the club?
   - Jambo gani muhimu umejifunza katika klabu ya mazingira?
8. What is something you want to learn about the environment?
   - Jambo gani unataka kujifunza lihusulo mazingira?

Teacher Interview Questions
1. What does environment mean to you?
   - Nini unafahamu mazingira?
2. What is one thing you would change about the club that would make it better?
   - Unafikiri ni nini kinaweza kuifanya klabu kufanya vizuri?
3. What is the most important environmental problem in the community?
   - Tatizo gani kubwa linalow apata jamii kimazingira?
4. What is one way students can be more involved in the club?
   -
5. Do you use different ways of teaching other than the chalkboard?
Community Interview Questions
1. What does environment mean to you?
   - Nini unafahamu mazingira?
2. Do you participate in the environmental club and its activities?
   - Jee unashiriki katika klabu ya mazingira?
3. What is the most important thing you have learned form the club?
   - Mambo yapi muhimu umejifunza katika klabu?
4. What is one thing you want to learn more about the environment?
   - Ikiwa utacha guwa jambo moja la kujua kujifunza mazingira utachaguwa ipi na kwa nini?
5. What do you think would make the club better?
   - Unafikiri ni nini kinaweza kuifanya klabu kufanya vizuri?
6. What is the greatest environmental problem in the community?
   - Tatizo gani kubwa linalow apata jamii kimazingira?

Sheha Interview Questions
1. What does environment mean to you?
   - Nini unafahamu mazingira?
2. What are the environmental problems in your community?
   - Unafikiri ni nini kinaweza kuifanya klabu kufanya vizuri?
3. Are there any laws that help protect the environment?
   - Kuna shena ye yote inayosaidia uhifadhi wa mazingira?
4. How are they enforced?
   - Hatua gani mnachukua kama kuna tatizo limetokea?
5. What do you hope to see change for the future of the environment?
   - Vipi unadhani kuona mabadalikio ya baadae kimazingira
Appendix III

Student Survey (English)

Environmental Club Informational Survey

This survey is to gather information about the structure of environmental education and the environmental club at your school. Individual answers are anonymous and will not be seen by anyone except the researcher. General conclusions from your answers will help in the creation of an Environmental Club Guidebook.

<table>
<thead>
<tr>
<th>Answer questions in either Kiswahili or English</th>
</tr>
</thead>
<tbody>
<tr>
<td>Please answer questions honestly.</td>
</tr>
<tr>
<td>If you are uncomfortable with any of the questions you don’t have to answer them.</td>
</tr>
</tbody>
</table>

1. Why is the environment important to you?
2. What is a Club?
3. What are the goals of your environmental club?
4. What have you been taught about the environment in school?
5. What resources and information are needed for students to run the club?

Student Survey (Kiswahili)

Tafiti ya kutafuta maelezo kuhusu klub za mazingira

Tafiti hii ni kwa ajili ya kutafuta maelezo kuhusu muundo wa elimu ya mazingira na klub za mazingira maskulini.
Majibu binafsi ni siri na hayataonekana na mtu mwingine ila mtafiti peke yake.
Maelezo kutokea na tafiti hii ni kwa ajili ya kusaidida kutengeneza kitabu kitakachotumika katika muongozo wa klub za mazingira.

Tafadhali jibu maswali kwa Kiswahili au kiingereza
Tafadhali jibu maswali kwa ukweli.
Ikiwa hujisikii kujibu swali lolote usijilazimishe kujibu liache.

1. Kwanini mazingira ni muhimu kwako?
2. Nini maana ya klub?
3. Nini malengo ya klub yenu ya mazingira?
4. Umefundishwa nini kuhusu mazingira skuli?
5. Rasilimali gani na maelezo gani wanafunzi wanahitaji ili kuweza kuendesha klub ya mazingira?
Appendix IV

<table>
<thead>
<tr>
<th>Interviewee status and type of interview</th>
<th>Name of study site</th>
<th>Total number</th>
<th>Number of males</th>
<th>Number of females</th>
<th>Grade level/age</th>
</tr>
</thead>
<tbody>
<tr>
<td>STUDENT (Survey)</td>
<td>Makoongwe Island Primary and Secondary School</td>
<td>28</td>
<td>12</td>
<td>16</td>
<td>Form I-IV</td>
</tr>
<tr>
<td></td>
<td>Vitongoji Primary and Secondary School</td>
<td>31</td>
<td>15</td>
<td>16</td>
<td>Standard VII, Form I, Form III</td>
</tr>
<tr>
<td></td>
<td>Limbani Secondary School</td>
<td>29</td>
<td>13</td>
<td>16</td>
<td>Form III</td>
</tr>
<tr>
<td>STUDENT (Interviews)</td>
<td>Makoongwe Island Primary and Secondary School</td>
<td>6</td>
<td>3</td>
<td>3</td>
<td>Form I-IV</td>
</tr>
<tr>
<td></td>
<td>Vitongoji Primary and Secondary School</td>
<td>6</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Limbani Secondary School</td>
<td>6</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>NON - STUDENT (Interview)</td>
<td>Makoongwe</td>
<td>20</td>
<td>9</td>
<td>11</td>
<td>23-60 years</td>
</tr>
<tr>
<td></td>
<td>Vitongoji</td>
<td>11</td>
<td>5</td>
<td>6</td>
<td>30-56 years</td>
</tr>
<tr>
<td></td>
<td>Wete</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>Unknown</td>
</tr>
</tbody>
</table>

Total students survey = 88
Total student interviews = 18
Total non-student interviews = 41

Study Participants ** All participants not included requested to stay anonymous.

Community:
Mr. Ali – 8 April 2013
Rashik – 8 April 2013
Sifuni Haji Ali
Shaibu Khamis Uleid
Sifuni Ali Haji
Khamis Salim Ali
Hassani Vuai Haji
Khamis Ali Barake
Haji Metta Makame
Zainabu Ali Mdowe
Said Massud
Ali Mohd Haji
Ame Vuai Haji
Wardat Iddi Omar
Fatma Mohd Ali
Safia Ali Mussa
Mwaache Bakar Makame
Mwajuma Bakar Makame
Mwajuma Khamis Ibrahim
Asha Suleiman
Tatu Ramadhani
Salama Bakari
Muranahamisi Juma
Ali Shaibu

*Teachers:*
Ali Yussef – 2 April 2013 (11:00 am)
Zahor Khamis – 2 April 2013 (9:30 am)
Saidi Ali Said – 3 April 2013 (11:00 am)
Aflah – 5 April 2013
Omar Ali – 4 April 2013

*Sheha*
Salum Ayuba Suleiman
Juma Mrisha

*Students:*
* All students preferred to stay anonymous for the study
<table>
<thead>
<tr>
<th>Column 1</th>
<th>Column 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appendix V.</td>
<td>Table 1. General description and characteristics of two environmental school clubs and two environmental NOS located on Pampa Island.</td>
</tr>
<tr>
<td>45</td>
<td>June 1999</td>
</tr>
</tbody>
</table>

### Table 1

<table>
<thead>
<tr>
<th>Column 1</th>
<th>Column 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>45</td>
<td>June 1999</td>
</tr>
</tbody>
</table>

### Column 1

- General description and characteristics of two environmental school clubs and two environmental NOS located on Pampa Island.

### Column 2

- June 1999
Appendix VI.

Diagrams are identical to what the Makoongwe teacher, Zahor Khamis, drew during his biology class on Ecosystems. 

*Diagram A.* Examples in parentheses were the live organisms brought into the classroom and presented for each level.

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*Diagram B.*