

Rapid Assessment Report for Fisherman Island (Moukele Village)
in relation to the impacts of climate change



Report submitted to the Pacific Centre of Environment and Sustainable Development (PACE-SD), University of South Pacific (USP), Fiji under the EU-GCCA Project

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Moukele Village (Fisherman Island) Rapid Assessment Report

Brief Introduction

Moukele village is located on Fisherman Island outside of the main city of Port Moresby about ten kilometers away. Moukele village is located at a bearing of Eastings 147°04.738', Northings 09°30.668' and has a long history of human settlement.

The Island has a total area of 3.8 km² and is made up of mainly limestone. The small atoll island consisted of approximately 1,000 population and most of the villagers live on the fringe of the island. The geography of the island is mostly flat with sandy soil and limestone making it unsuitable for gardening. The southern part of the island is mostly limestone which takes up three quarter of the total landmass. The flat geographic landscape has a great impact on the islanders forcing them to settle only to one side/end of the island. The extreme condition of the island had forced the locals to seek outside sources for their survival such as obtaining food and water supply from the main city of Port Moresby.

Fisherman Island was a fishing village before the colonial days by the Motuan coastal people. It was also established for the trade winds by the Motuans and the people of Gulf during the Hiri Moale trade expenditure in which most of the mainland coastal people travelled as far as Aroma to trade their products. The current settlers living on the island originated from the coastal village of Hula, in the Eastern coastline of Central Province. Figure 1 shows the map of the island with Port Moresby (Nation's Capital) on the mainland.

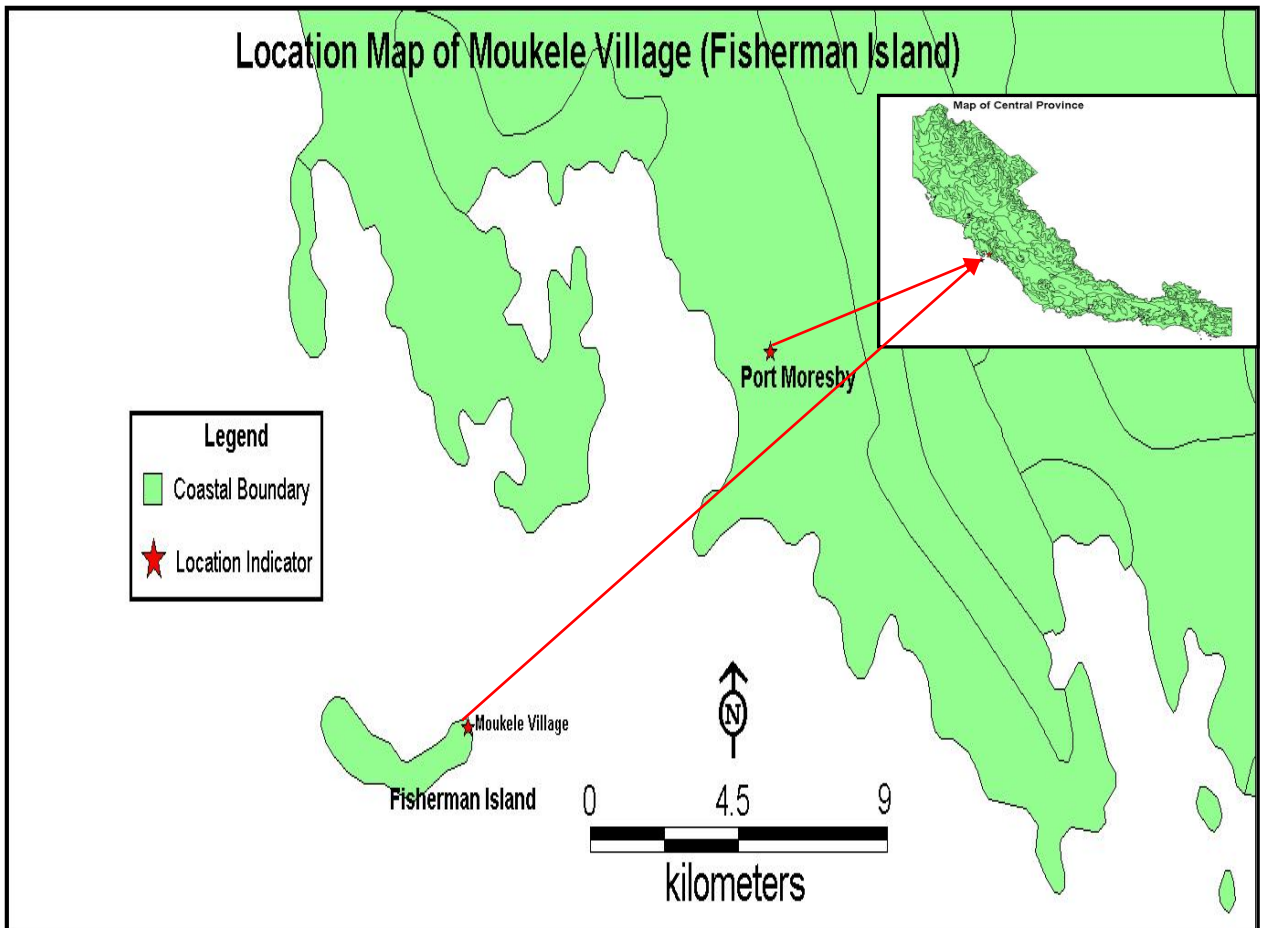


Figure 1: Location map of Moukele Village on Fisherman Island about ten kilometres outside of Port Moresby.

1. Governance Component Discussion with Men

Firstly, the men's discussion group was asked to provide the hierarchical organization structure that exists in the community. They have one main organization structure with the church leader (s) (Head Pastor, United Church) in the top hierarchy, and then subdivided into two major groups, the Spiritual and Non-spiritual (Fig.2). Such groupings make the leaders more flexible in doing their official duties apart from the normal parental responsibilities. Since the island community is located close to the city, an organised leadership duty is an important element to provide to manage the members of the community, Fisherman Islanders.

The youths are never given the opportunity to express their views as revealed by the man's discussion group. All decisions are made by the elderly man, but during the discussion they stated that now they will incorporate youths in the decision making processes. This was a positive step taken by the man's group, which was a good start for a community like Fisherman Island to benefit any project that comes on board.

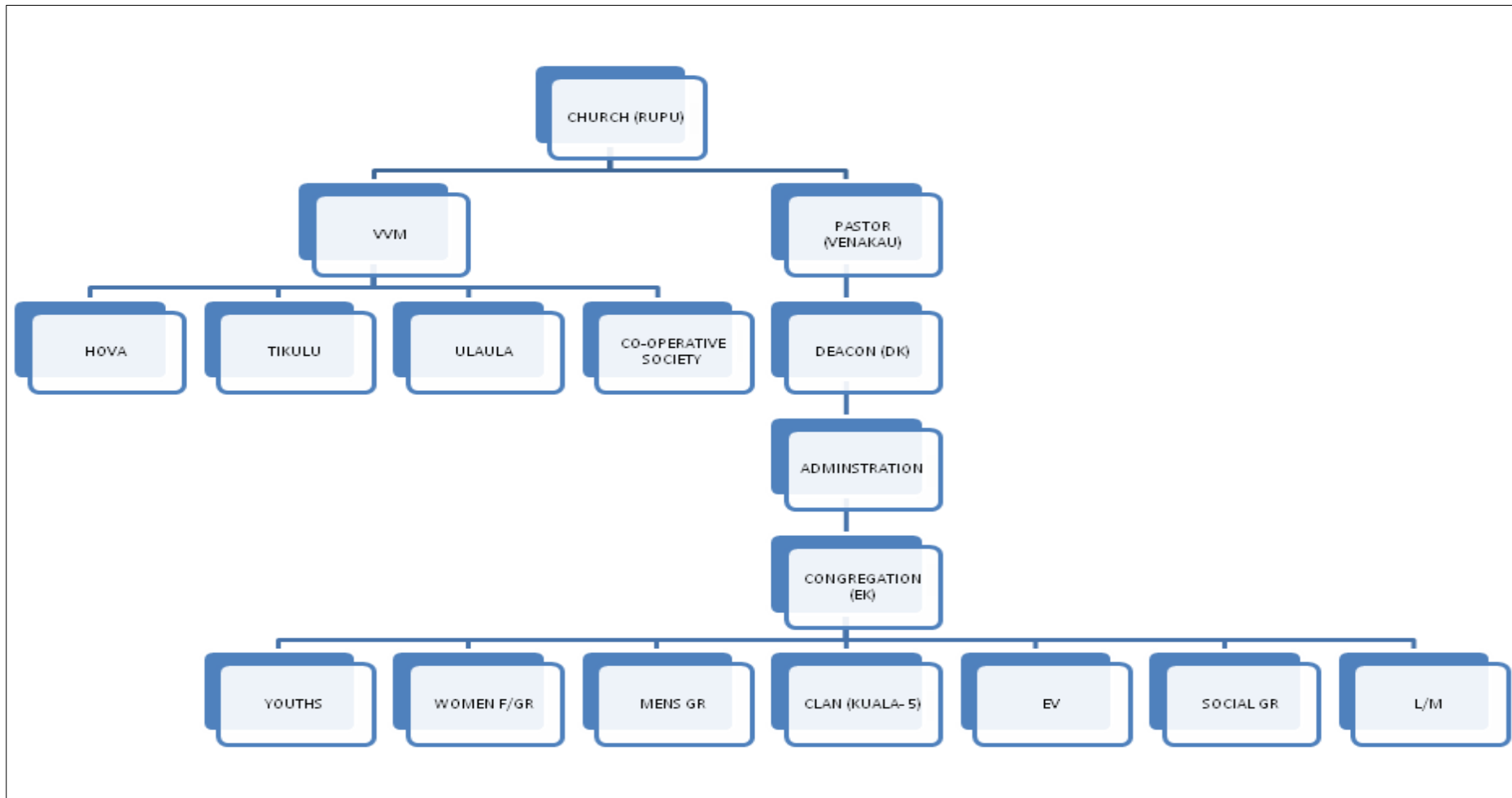


Figure 2: Moukele village organisation structure. Head of the only denomination, United Church is top of the hierarchy and then further subdivided to Non-spiritual and Spiritual Activities. A well organised leadership structure that exist in community.

Problems faced by leaders and solutions

The male folks then asked to identify the main problems they face as a leader, or a head of the immediate family unit or any other organised group in the society/community while living on the island. Table 1 is a summary presentation of all the possible problems and solutions that came about through the discussion. A lot of issues being discussed, ranging from socio-economic, pollution, health, education, communication, water and others. By looking at the possible solutions for each problem identified; some issues can be solved individually, others as a community and even some through local or national elected members.

Table 1: Problems identified and possible solutions

PROBLEMS	SOLUTIONS
Lost in sea/rainy days, dinghy capsized	-need lighthouse/regular coast guard -currently nothing in place to cater for such problems
Weather check-high tide/rising sea level	-PNGNWS, currently no such services provided, only hear on NBC Provincial Radio station and families living in Port Moresby city
Housing structure	-more flat houses suitable to weather conditions encouraged
Lack of risk management plans	-currently none, must draw up one
Overfishing	-observe Government Laws -avoid catching undersized fish -reconsider use of net size
Out fishing risks	-if enough funds and projects to cater for peoples' needs,
Sea pollution (rubbish)	-Moving gouth
Compulsory schooling	-local member should subsidise school fee on the island -community should help each other's burdens in sending all kids to school
Fresh water insufficiency/scarcity	-Cart water from mainland/Koki (too costly)
Sanitation	-all forms of waste goes to sea or uninhabited rocky sites
Net work (mobile)	-Community Development Committee (CDC) to see
Bad weather affect food security	-manage well the food sources available in such weather conditions
Emergency cases	-no good response from local member and National government, a lot of people died through negligence
Health centre	-none on the island, when sick they come to towns or nearby clinic on mainland at Roku
Overcrowding (Houses)	-give more spaces, people now building houses on further end (west) of the island
Sinking island	-proposing to resettling or migrating to mainland where their ancestors have originated from, Hula village

2. Coastal Environment Discussion with Youths

The following report discusses coastal environmental issues by the Youth Group of Moukele village on Fisherman Island about 2 km outside of Port Moresby, National Capital District – Papua New Guinea

Problems Encountered:

During the Moukele youth discussion on the coastal environmental issues affecting their coastline and their community, some of the problematic issues were identified. The following were some of the issues as discussed which needs urgent attention;

- ***Coral Bleaching***
 - The villages have identified some of their fishing sites located on the surrounding reefs that most of the reef fish species have migrated out over the past years due to the reef dying as a result of climate change. They have claimed that since the surrounding sea has become warm, the reef life wasn't like before. They have seen that the reef began to turn white and die out, as a result they had to travel several kilometers out to the open sea to fish and this has caused so many lives out in the seas over the years.
- The other issue raised during the discussion is the amount of fish catch have decreased over the past years and this as put extreme pressure on the villages due to the fact that the villages depend on fish as their main source of protein.
- They have also claimed that the seaweed cycle have changed over the past years. They say that the seaweed usually dies out during the month of October and December but over the past years, the cycle as change and the seaweeds have started to die out around January and February. They made this comments because they think this had put pressure on the fish to exit their hide holes under the rocks to feed during those months, as a result, their source of protein have declined.
- ***Coastal Erosion***
 - Coastal erosion has become an ongoing issue on the island. It has been claimed that the waves from the sea are going into the village during high tides and most of the houses are already vulnerable of being washed away. From observation by the project team, the coastline which was once covered with sand is now bear rocks and the coastline is more vulnerable to more erosion since there are no sea walls built around the island (Fig. 3).



Fig. 3: People have built temporary stone walls to stop rising sea water coming into the village as this picture shows.

- ***Health and sanitation***

- Health and sanitation has been a major problem for the island people. Curable diseases such as cholera, TB and typhoid can be prevented if the island people have taken measures and steps to live in a clean environment but this has been limited to the island condition. The island problem is associated with the unhealthy living style that the island people have adopted. Since the island is flat and there are no bigger trees to act as wind breakers to reduce wind velocity, most of the pit toilets built on the island have been blown away, this has caused more problems to the islanders and as a result, the islanders turned to use the sea to relieve themselves. Apart from that, there are no water on the island which has caused a dramatic stress on the islanders to use the sea for bathing and preparing their food. The unhealthy conditions have placed a greater risk of an outbreak of diseases to spread rapidly in the island community, whether it could be water borne or air borne diseases. The island situation requires an urgent attention and needs to be addressed as soon as possible before an outbreak of disease takes place on the island.

- ***Waste Management***

- Most of the island non-biodegradable waste have been dumped in dug out holes around the island and buried but this has also put a lot of stress on the soil texture and condition (Fig 4). This might be a big problem in the future for the islanders since the soil may contain a high level of arsenic which may cause future problems in the community such as skin diseases etc... Apart from that, the ocean is full of city waste such as plastic bags, water bottles and many other non-biodegradable waste which are washed onto the coastline of the island. There is no proper waste management plan on the island and this as had a great stress to the natural environment.
- Apart from that, Human waste and animal waste is also dumped into the sea and this may trigger an outbreak of diseases in the future.



Fig. 4: An example of a pit being dug within the village where rubbish (both organic and inorganic stuff) is dumped.

Future Problems

- *Air pollution*
 - The multi-million Liquefied natural gas (LNG) project is located just a few kilometers away from the Fisherman Island. The locals have claimed that they have been receiving bad smell from the project site and this could be a big problem for them in the future when the actual LNG project commences its operation.
- *Oil Pollution*
 - Oil pollution has been identified has one of the biggest threat to the island community. The LNG project will attract many foreign shipping vessels into the harbor to export crude oil to other countries around the world and this could have greater consequences on the marine life if there is an oil spill or a ship wreck in and around the harbor.

Problem Solutions:

Apart from the problems being encountered in the island community, the Moukele youth group had also identified some of the solutions and ways on trying to address the escalating problems faced in their daily life on the island.

- *Coral Bleaching*
 - The community had identified that the solution to conserving their coral reefs is to replant corals in and around the island and to seek advice from the responsible authorities to address the ongoing issues.
 - Dynamite fishing, over fishing and drift net fishing will be address in the community to minimize or stop the type of fishing techniques that the island communities are currently applying.
 - According to the seaweed cycle, this issue has been identified that it can't be solved but require nature to take its cause.

- *Coastal Erosion*
 - This is an ongoing issue and the youth community had come up with a solution to build sea walls around the island but this will also require funding from outside sources to assist in providing trainings and purchase of some essential materials to construct the sea walls.
- *Health and Sanitation*
 - It is a community issue which has to be seriously dealt with by the leaders of the community. Since there is no proper organization or community structure on this issue, the youth community has identified some possible solutions to the problem. They have decided to address this issue by asking the community elders to look into these issues like coming up with a management plan, seek outside funding to purchase water tanks, address issues on hygiene and dispose their waste in a proper disposal site.

Future Problem solutions

- Seek advice from the higher authorities and take legal action if there is an increasing concern in the community which needs to be address.

General Observation and conclusion

From observation by the project team, it has been observed that the communities really need urgent assistance from the Papua New Guinea government and also from outside funding sources to address the ongoing issues faced by the community due to climate change. Climate change is already having a greater impact on the island community. The following are some of the issues which need to be addressed;

- It has been found that coastal erosion is a reality and the coastal community is vulnerable to the high waves going into the coastal village and having a greater impact on the lives of the local community.
- The local community really needs a proper community building to cater for water tanks to provide water since there is no water on the island which has created pressure for them to travel to the mainland to purchase water in containers and bring back to the island.
- Health and sanitation has become a great concern. There are no proper toilet facilities on the island. Consequently, human and animal wastes are dumped in the sea which may provide venues for bacteria to reproduce and possibly cause an outbreak of disease in the community. Apart from that, the island doesn't have clinics or an aid-post to cater for the increasing number of sick patients on the island. This has been one of the causes of islanders travelling to the mainland to seek medical assistance and many lives have been lost because of the long distance being travelled to the main city for medical treatment.

Community Initiatives and Projects

Currently the Moukele community has been able to establish a number of projects in their island community and these projects have been successful so far. The following are some of the projects being established;

- EU water tank project (Fig.5)
- This project has been a successful project but the increasing number of population, the number of tanks provided couldn't cater for the people on the island. The ratio of five families to one tank is not sufficient for the increasing needs of the people and this has caused the locals to seek other sources for water.



Fig. 5: Water tanks given by European Union, no proper foundation to support tank as this picture shows.

- Solar Panels for lighting
- This project has been made possible by the local Member of Parliament but the solar panels were not enough to cater for the whole island families, therefore, generators are used as an alternate source of lighting instead of the solar panels.
- Currently, the community is raising funds to build a health center on the island to cater for the increasing population but there are some constraints associated with that. They will need funds to build houses for the nurses and doctors and also funds to purchase medical equipments and drugs.

Apart from that, the community has a good track record of project management on the island. Most of the community funding comes from the local community to initiate projects on the island. The community uses church funding collected during church services to carry out projects on the island and also from fundraisings. These funds are used and managed by the elders to start community projects. From observation, this island community has greater needs and also the community themselves are working very hard to help themselves. To

conclude, the issues raised in this report will need urgent attention and can be addressed for the betterment for the island community since the community is vulnerable to climate change.

Recommendations

The following recommendations are some of the issues which can be addressed due to the effect of climate change on the island community;

- Sea walls to be built around the island (Fig. 6)
- Bio-degradable toilets to be established or introduced into the island
- A health center should be built on the island
- Replanting of coral reefs
- A tree planting project should commence on the island to create wind breakers.
- Water tanks should be donated to the island community



Fig. 6: Temporary sea walls (wood, drum, etc) erected on the island to prevent storm surge or rising sea level.

3. Socio-economic Assessment: Daugo/Fisherman Island

This report based on the socio-economic assessment of the people of Daugo/Fisherman Island on the Global Climate Change Alliance project funded by the European Union and implemented by the University of the South Pacific. The component of the project in Papua New Guinea is coordinated by the University of Papua New Guinea through the School of Natural and Physical Sciences under the Discipline of Environmental Science and Geography.

Socio-economic Information

The total population of Daugo Island (also known as Fisherman Island) is 1,053 according to the 2011 census preliminary results which comprised of 560 males and 493 females. The total number of households is 207. The people living on Daugo Island are fisherman migrants from Hula area of the Central Province. Their ancestors settled on the island some 60 years ago which the landowner from Tatana village gave them the user right to inhabit the island.

The entire island is largely covered by coral sand and rocks (Fig. 7). As a result the land is infertile for cash cropping and subsistence farming all year round. In other words, it is not arable land. The main source of income and livelihood is derived from subsistence fishing. Most of the fish are sold at the Port Moresby city markets.



Fig. 7: A few houses being built on rocky surfaces as shown here, and the area in the foreground is covered with limestone rocks.

During the focus group discussion on food and water security held on the Island on Saturday January 12, 2013, the following issues were highlighted on the Global Climate Change Alliance (GCCA) Assessment:

a. Food security

- Staple food: Rice and tin fish
- Food from the market: Tapioca (cassava), banana, vegetables, etc.
- Grow limited tapioca and kaukau (sweet potato) during the wet season only. Mainly backyard gardening (small patches).
- There is no gardening during the dry season due to no water.

Fish:

- Trawling for tuna and other fish
- Net fishing: any type of fish including red lips
- Spear gun diving for any fish
- Shell collecting: Crocker shells, etc.
- Spotlight fishing: long-thorn fish

Sea cucumber

- Main income or fast income. However because of the ban imposed by the National Fisheries Authority (NFA) on the harvesting of sea cucumber has prohibited the sale of the product. This has affected their source of income.

Disadvantage of fishing

Some of the disadvantages highlighted of fishing especially in relation to fish sold at Port Moresby markets are:

- High market fees
- Lack of water to wash fish at the market
- Cleanliness of the market (dirty)
- Poor toilet facilities
- Generate little income because of cost of petrol and dinghy fares.

b. Water security

Water is a critical problem on the island but the people managed to survive from long period of drought. Some of the issues highlighted are listed below.

- Not enough tanks to store rain water.
- Water is a critical problem on the Island. Many people lack safe drinking water. The water tanks provide under the European Union funding is not sufficient for the entire population. There are about 29 tanks provided by the European Union which is shared among eight households in the village
- No borehole
- The people buy water from a person who sells them in the village.
- Only those with dinghies go to Koki Market to buy water.
- Water is a major problem in the village during the dry season from July to December.
- Lack of water affects the running of the only school on the island.

c. Proposal

The following were identified as some of the needs on the islands to improve the livelihood and the living standards of the people. **These needs are not listed in any order of priority.**

- Need a barge to deliver water to the island during dry season.
- Lift the ban on sea cucumber harvesting
- To set up a deep freezer on the island where they can store their catch for export to Port Moresby local markets and overseas. This will require a deep freezers and solar power generator.
- Need for each household to have its own water tanks and a 3-4 backup tanks to be installed at the church, community hall and the school for emergency purposes.

Women empowerment projects

- Women should be given some money to make their own money to minimize the fish or water problem that they are facing at the moment such as sewing machines to sew clothes and need little tables or stalls to sell clothes, etc.
- Build a women's guest house in the village so women can cook and get some income. Money goes to the church or community

- Need to build a conference hall – for special meetings which can be used for public meeting and international conferences.
- Need to improve public sanitation by building toilets per family or household.

Need for improvement of School facilities

- Need more toilet for schools
- Fence for the school to prevent public access to school facilities, e. g. use of toilets facilities.
- Tanks for the school for drinking and for toilet.
- Need to set up a school canteen.

General observation/comments

The Daugo people are very friendly people and the island is one of the hotspot picnic site for the Port Moresby city dwellers especially the middle/upper class expatriate community with luxury boats.

The people are relatively poor and basically derived their livelihood from the basic market food crops as well as tin fish and rice which they buy from their sale of fish at Port Moresby city markets. Most of the village people are subsistence fisherman. There are only a handful of people that commute to the city of Port Moresby by dinghies for formal employment during business working days. Their estimated average income is around K 500/fortnight for those employed in the formal sector. However, the average income generated from the sale of fish is roughly the same and is subjective to the weather conditions according to the women focus group. In bad weather most families survive on bare minimum.

Food and water security is a major challenge of the population in the village. Many politicians have come and gone and there is no major development in the village other than the development of the church building, the school and the community hall and the European Union funded water tanks. Most of the households have make-shift houses to live in with few exceptions. The village councilor is a former lecturer at the University of Papua New Guinea. The Daugo Island is part of the Tatana constituency of the Motu Koitabu Assembly which comes under the Port Moresby South electorate of the National Capital District.

Conclusion

Daugo Island is an atoll island and is affected by high tide, soil erosion and pollution from the city in terms of waste from the city of Port Moresby. The island is highly vulnerable to environmental damage from oil spills and the effects of climate change and sea level rising. There are no major adaption measures taken on the island at the moment. A small portion of the island is inhabited while the rest of the island is infertile and uninhabitable because of the coral rocks which occupy the major part of the island. Food and water security are the major challenges on the island. The national government and international development partners need to address some of the basic adaptation needs of the people highlighted in this report.

Acknowledgement

I, Mr Alonk as the In-Country Coordinator for the EU-GCCA (European Union-Global Climate Change Alliance) Project here in Papua New Guinea would like to acknowledge

certain individuals and community members. Firstly, I take this opportunity to thank the Team Members namely Ms Eleina Butuna, current NASA President and Mr. Freddie Alei both are lecturers within Environmental Science & Geography Discipline, University of Papua New Guinea. Ms Butuna contributed on the Socio-economic section discussion with Women focus group while Mr Alei on marine environment with the Youth group. I also thank Mr Keimelo Guima and his son Joel for organising our trip to the island, and all the support provided for the success of the meeting held on the island. For the community members, your corporation and participation is very much acknowledged.

Photographs



The assessment team getting prepared to travel to the island at the Royal PNG Yacht Club dockyard.



The whole community gathered together for a movie show in the night. Everyone expressed interest after watching different movies (DVDs) on climate change issues. The documentary from Pele Island MPA (Marine Protected Area) was very useful, and it changes the mindset

of islanders and now they have decided to mark a day in every month to do a community clean up on the island. They also proposed about starting on a MPA project on the island.



Community gathering and listening to the series of presentations being done by the Assessment Team Members after the welcome speech by the chairman.





Group discussions for the man, woman and youth on the problems they face, and what they do to minimise or solve the problem.



A lot of issues were raised during the discussions and presented here, and it was a first time for the youths through this gathering where they were given opportunity to speak in public gathering.



General observation, community participation, population pressure, existing project implementation, waste management and livelihood on the island