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Pandyaswargo Andante Hadi, Naoya Abe, Hong
George William C.

Participatory workshop on bottom – up study contributing
to the realization of Sustainable Development Goals:
Pangan-an Island case study

Department of International Development Engineering, Graduate School
of Science and Engineering, Tokyo Institute of Technology
<http://www.ide.titech.ac.jp/TR>

Participatory workshop on bottom – up study contributing
to the realization of Sustainable Development Goals:
Pangan-an Island case study

Pandyaswargo Andante Hadi¹, Naoya Abe^{1*}, Hong George
William C²

¹Tokyo Institute of Technology

²De La Salle University

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Pangan-an Island case study

Project Report

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FOREWORD

This study is conducted under a big project umbrella, Sustainability Transformation beyond 2015 (post 2015) supported by the Ministry of Environment (MOE), Japan. Main objectives of the project are, to contribute an input to the UN debate on establishing the post-2015 development agenda, to promote trans-disciplinary research facilitating the transformation towards sustainable Japanese society, and finally to create a new trans-disciplinary epistemic community by promoting research-based collaboration.

This particular study is part of the annual study under the theme 1 (Integration and Goal-setting) and sub theme 2 (bottom up study contributing to the realization of sustainable development goals) of the post 2015 project. In this study, we chose Pangan-an Island, in Cebu, Philippines as our case study. This study is the second case study after the first one conducted in Surabaya City, Indonesia. The Surabaya city was selected as the first case study location based on the recommendation of the MOE due to a number of Japan's projects and partnership with the city. The Pangan-an Island is selected due to existing experience of our partner scholar who worked with the island on a renewable energy project. Moreover, the Surabaya city is an urban area whereas the Pangan-an Island is rural. By choosing this island, we strive to get data from diverse characteristics.

PREFACE

The specific background of our study is the existence of challenges within the Millennium Development Goals (MDG) including:

1. The abstract and various definition of sustainable development have led to lack of concreteness in implementation
2. Different level of quality standards among countries
3. The “one-fits-all” approach is not suitable to facilitate the various conditions in the different countries and individual
4. The existence of gaps between goals and the reality in the society

The specific aims of our study are:

1. Contribution to the development strategy for development goals that is able to represent the society’s actual need and bringing this idea to national and international discussion
2. With understanding of the importance of capacity development in the post MDGs, this research is aimed to contribute to the formulation of capacity evaluation and monitoring strategies

This research is also hoped to give an opportunity for our respondents and research partners to voice their opinion on past reflection, current challenges, future needs and visions of their life. This will in turn, provide the basis for initiating effective action plan for capacity development in part of achieving development goals.

To provide a good understanding on the needs and challenges at the “bottom”, the study utilized the participatory workshop approach. Participatory workshop is an approach that allow where a number of people from a certain community actively voice their opinion. Similar to the first Surabaya case, the workshop in Pangan-an Island took 4 days, separating the female from the male groups to encourage honest and liberal voices. Each case study area is to be visited once in an academic year.

ACKNOWLEDGEMENTS

This report is written as part of POST 2015 project funded by the Ministry of Environment of Japan. The report is prepared by Andante Hadi Pandyaswargo, Assistant Professor, International Development Engineering, Tokyo Institute of Technology; Abe Naoya, Associate Professor, International Development Engineering, Tokyo Institute of Technology, and George William C. Hong, Part-time Professor De La Salle University. Significant support and contributions to the report were provided by Shintaro Oya, Bachelor Student, International Development Engineering, Tokyo Institute of Technology; Thomas Heyrosa, Claude Cortes, Althea Monic Menoria, Jason Baclayon, and Benedicto Mari who are the local facilitators from Cebu City.

ABBREVIATIONS

MOE	Ministry of Environment
Post-2015	Sustainability Transformation beyond 2015
MDGs	Millennium Development Goals
NSBC	National Statistical Coordination Board
PWS	Participatory Workshop
SDGs	Sustainable Development Goals
PV	Photovoltaic

EXECUTIVE SUMMARY

MDG'S IN THE PHILIPPINES

The National Economic and Development Authority (NEDA) in coordination with the national statistical coordination board (NSCB) of the Philippines have published several reports on the country's progress on Millennium Development Goals. The reports defined where the country is relative to the MDGs, and also outline the challenges that have to be overcome in order to attain the goals that are not achieved yet. The "MDG watch" published by NSCB in March 2014, showed that the goals that have some positive progress in general are 1) Goal 4: Reduce child mortality 2) Goal 6: Combat HIV / Aids, Malaria and other diseases 3) Goal 7: Ensure environmental sustainability and 4) Goal 8: Develop a global partnership for development. Progress on Goal 8 is especially fast on the indicator of cellular phone subscribers per 100 populations that increased from 0.1 to 95.2 in year 2011¹.

The other goals (Goal 1, 2, 3, 5 on poverty and hunger, universal primary education, gender equality, and maternal health) are mainly progressing very slow or moving backwards.

NEDA's report to the United Nations (UN) listed down what worked and what did not work in terms of interventions since the adoption of the Millennium Declaration 2000². On the 2012 report, the things that helped the attainment of goal targets and indicators are including the participation of various stakeholders – business sector, civil society, community/people and international development partners supported by clear institutional arrangements. But despite of the efforts, there are target that may not be able to be attained. The things preventing this attainment are including:

1. Conflicting and overlapping policies
2. Weak implementation and monitoring at the local level
 - a. Lack of capacity
 - b. Resource constraints
 - c. Low compliance with the monitoring system
3. Growth is not inclusive
4. Urban and rural disparities
5. Data constraints
6. Man-made and natural shocks

PANGAN-AN ISLAND ADMINISTRATIVE STRUCTURE

The Philippines has 3 island groups, which are, Luzon, Visayas, and Mindanao. The island groups are divided into 17 regions, 81 provinces, 144 cities, 1,491 municipalities and 42,028 barangays³. Pangan-an Island is located in the Cebu province of the Visaya island groups. Cebu province has one main island called the Cebu Island and 167 surrounding islands. The capital of Cebu is Cebu City, which is the oldest city in the Philippines. There are 4 other

¹ (Philippine Statistics Authority - NSCB, 2014)

² (NEDA, 2012)

³ A barangay is the smallest administrative division in the Philippines and is the native Filipino term for a village, district or ward

cities in Cebu, called Danao City, Lapu-Lapu City, Mandaue City and Talisay City. In addition to the 5 cities, there are 8 other local government units. Figure 1 summarizes the administrative structure of Cebu.

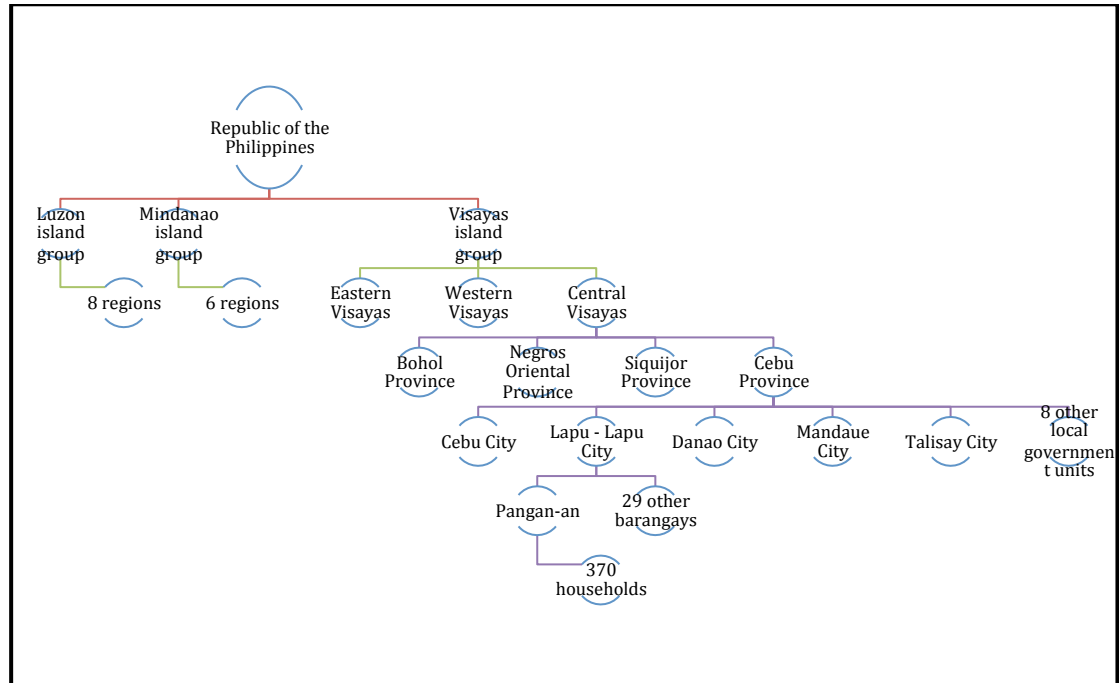


Figure 1 Cebu administrative structure

KEY ISSUES FOUND IN THE TARGETED COMMUNITY

One of the main outcomes from the workshop is the identification of the key issues existing in the community. The following key issues have been agreed by majority of the participants in the workshop through hearing individual voices, group discussion, and voting:

1. Water availability is limited during the dry season.
2. Income is heavily dependent to the sea and weather.
3. Proper sanitation and waste disposal is not available.
4. Electricity is not affordable and the solar plant is deteriorating.

Pangan-an is an off-grid Island. Electricity from the main Island is not integrated to this island. Before the existence of a solar panel in the island, the community has been relying heavily on kerosene for lighting. See Box 1 for information about the solar panel.

Box 1 Renewable energy in Pangan-an island

In year 1999, the Belgian government donated about 500,000 USD to install a centralized solar plant in Pangan-an island. The project was the first centralized solar project in the Philippines. Before the project, the people in the island used kerosene lamps and diesel generators for electricity. The project brought light designed for about 300 households in the island. There was hope in realizing that the 24-h electricity would enable the community to develop and improve the community's circumstance⁴. About 10 years after installation, the battery of the solar panel was fully deteriorated. On September 2001, 20 units of LED lamps were donated to the community with the objective to develop a lamp rental system that would require minimal amount of initial investment, which would sustain the project in the long term⁵.

⁴ (Hong & Abe, Sustainability assessment of renewable energy projects for off-grid rural electrification: The Pangan-an Island case in the Philippines, 2011)

⁵ (Hong & Abe, Modeling and optimizing a sub-centralized LED lamps provision system for rural communities, 2012)

CHAPTER 1 TARGETED COMMUNITY OVERVIEW

Cebu city and Lapu – lapu city are connected by bridges. Pangan-an Island is located about 45 minutes motorboat ride from Lapu – lapu city offshore. It has a population of about 370 households with about 2800 people. Fishing and shell crafting are the only prominent industry for the community. Similar to the Surabaya case study, this community was chosen based on the possible existing challenge in water (clean water supply, waste water treatment, sanitation), solid waste (waste management: waste segregation, collection, treatment), energy (electricity, cooking gas, kerosene, gasoline, or other commonly used form of energy), food, or income and opportunities. The process of people selection to join the participatory workshop (PWS) was led by our research partner, Dr. George William Hong.

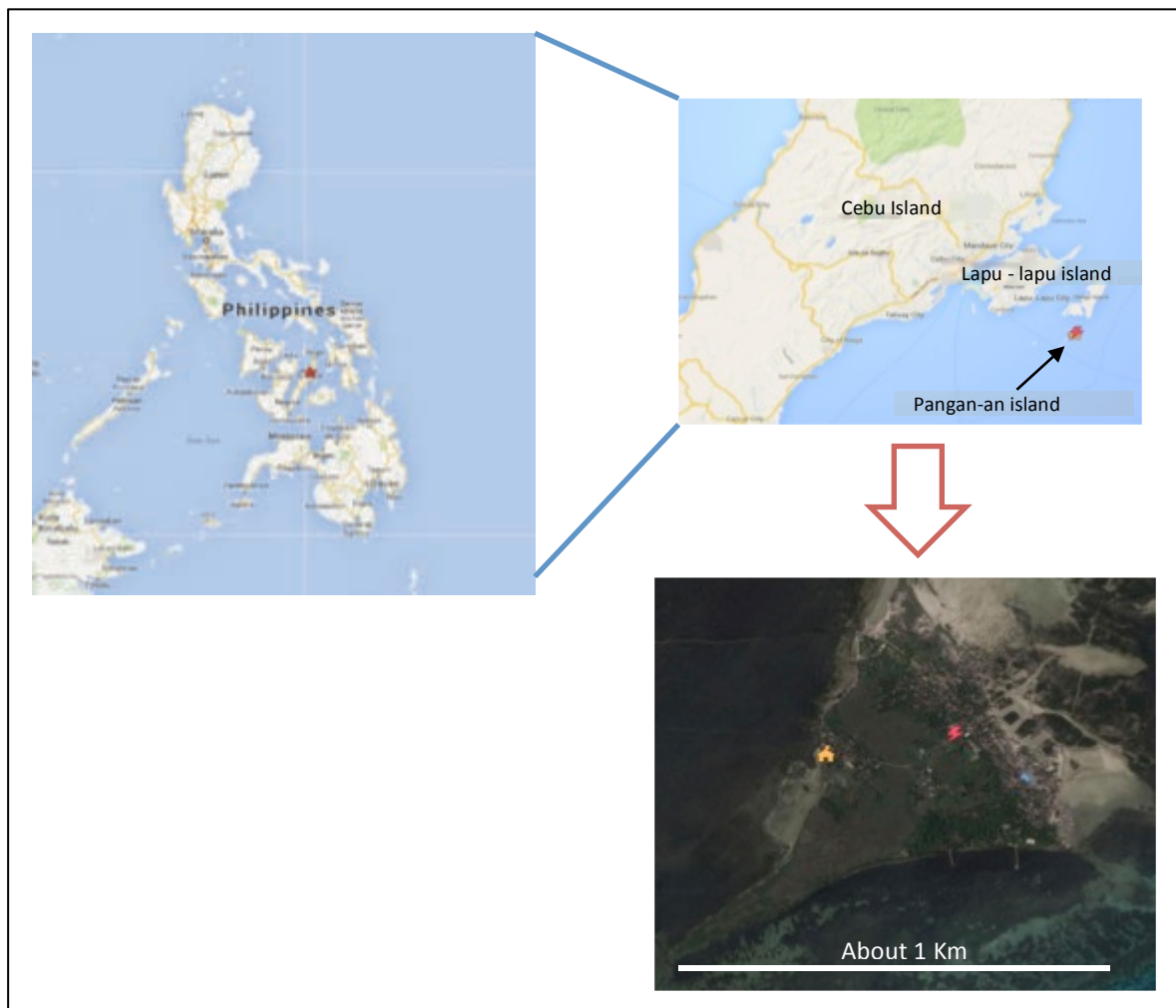


Figure 2 Location of Pangan-an Island

The targeted group of age is around the age of 30 to 50 years old with the assumption that this group has responsibility of providing a living for his or her family both in physical and

material ways. Moreover, the targeted group of age is assumed to still actively be involved in the community during the implementation of Sustainable Development Goals (SDGs) post 2015. Table 1 and 2 listed the attributes of each participant and their households.

Table 1 Participants' personal attributes

Participant's personal attributes	Average or %
Gender and age	
Male	50%
Female	50%
Age	36.4
Education Level	
NA	3%
Some Elementary	12.5%
Elementary	28%
Some High School	3%
High School	40%
Some College	3%
College	6.3%
Occupation	
Fishermen	44%
Housewife	46%
Other (tricycle driver, carpenter, shell-crafter)	9%
Income	
Female*	462.5
Male	4818.75

* 50% of the Female participants did not earn income

Table 2 Participants' household attributes

Household characteristics	Average or %	Std.	Min	Max
Number of household member	5.4	1.99	2	12
Number of children	2.6	1.5	0	6
Monthly income in Philippine Peso (PHP)	2,640.6	2560.7	0	8,200
Rent*	8	47.7	0	270
Water bill	547.6	271.3	120	1500
Electricity bill	320.9	105.9	250	750
Food	3726.6	1803.8	1500	8820
Transportation	413.6	553.6	100	2250
Telecommunication	83.3	60.7	24	184
Child Education	413.3	499.6	0	2500
Loan	817.8	451	300	1800
Non. El. Energy (Kerosene, Gas, Wood)	376.7	378.7	60	1660
Others (Medicines, Baby milk, etc.)	654.3	1010.3	100	3200

* In general, participants own the land and house (e.g. inherited from the ancestor); there is no rent fee. Only 1 participant is renting her house by paying 270 PHP/month to the house owner.

CHAPTER 2 METHODOLOGY

WORKSHOP STYLE

To respond to the diverse level of development in the society, participatory workshop (PWS) was selected to accommodate various aspirations. The approach of bottom-up as the main approach is important because it allows the targeted group of people at the lower income level to express their ideas and concerns. This methodology was chosen in hope for better relevance and applicability of SDGs post 2015 especially of the developing countries. During PWS, both sides (facilitators and participants) were able to discuss, exchange ideas, and get deeper understanding of challenges and aspirations of the communities. This includes, better understanding regarding the communities' thoughts about their current challenges, and future visions for the betterment of their living condition. Each workshop was conducted for 4 days. The first two days and the last two days were participated by different gender group. Table 3 and 4 shows the schedule of each day's program. To monitor changes in the community, the workshop are to be conducted once every year for 3 consecutive years.

Table 3 Schedule of Day 1 and Day 3 (first day for female group and first day for male group)

Time	Activity
10:30 – 11:30	Priority and Diversity Identification
11:30 – 12:15	System Mapping
12:15 – 13:00	Lunch break
13:00 – 14:00	Availability, Affordability, and Quality Assessment
14:00 – 15:00	Challenges Identification
15:00 – 16:00	Future aspiration Identification (goals identification)
16:00 ~	Facilitators Meeting

Table 4 Schedule of Day 2 and Day 4 (second day for female group and second day of male group)

Time	Activity
10:00 – 11:00	Filling questionnaires on participant's attributes
11:00 – 12:00	Identifying constraints and necessary capacities
12:00 – 12:15	Workshop evaluation
12:15 – 13:00	Lunch break
13:00	Facilitators meeting

Figure 3 shows the framework of the participatory workshop and the overall research. Activities within the workshop has four steps; collection, selection, analysis, and conclusion. The inputs are the general topics in the MDG. The outputs are the challenges, visions, necessary capacities, barriers, and targets within the community.

This study includes, so far, two communities in two developing Asian countries; Surabaya in Indonesia and Pangan-an island in the Philippines. Due to the limited number of sample we are taking, the results are not to be generalized. Rather, results would be an insight to the design of the new SDGs post 2015.

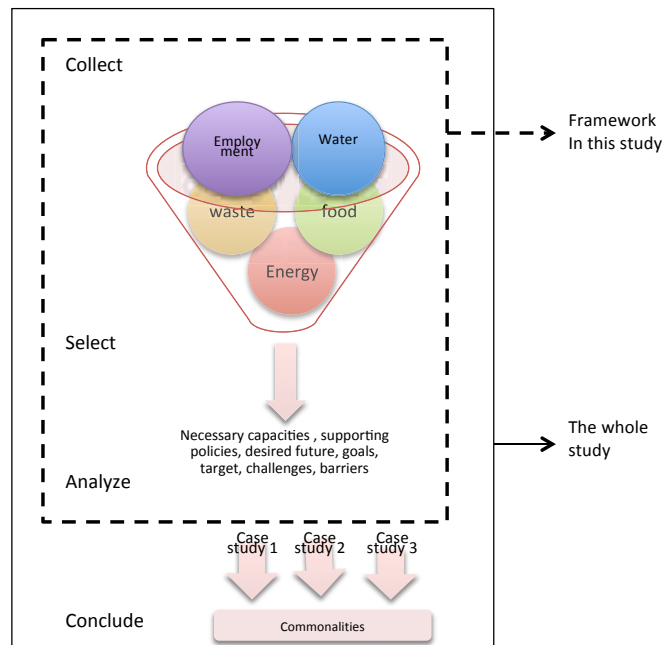


Figure 3 Research Framework

In this particular report, PWS was conducted in Pangan-an island community in Cebu province, Lapu – lapu city, Philippines. The participants did activities which approach is inspired by the UNESCO guidebook on participatory workshop tools for the young and the minorities. Female and Male groups did the PWS separately to encourage honest and liberal environment in expressing opinion and to enable identification of the priority and needs variance between the two groups. However, the content and flow are identical.

Priority and Diversity Identification

After the introduction of the PWS aim and opening by the community leader, participants were asked to express their voices and share their stories freely. The first task was to vote the priority of importance

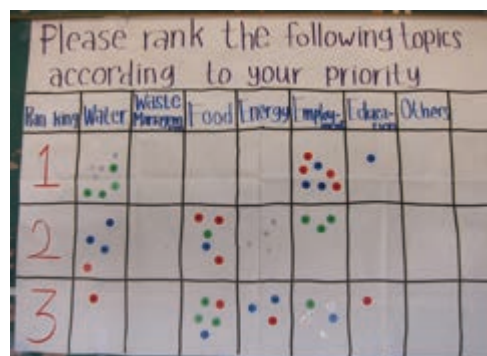


Figure 4 Priority Identification Poster

By using a poster shown in figure 4, participants were asked to vote their 1st, 2nd, and 3rd priority of the presented topics in terms of the importance in their daily lives. The options are water, waste management, food, energy, employment, Education, and others. Each participant has a number associated to her or him and each of them belongs to a certain color group. In other words, everyone is numbered and color-coded. The participants were distributed with rounded color seals with their numbers written on each seal. In this way, their answers can be tracked and identified. This will in turn, help us to understand the association of a certain participant's attributes and their answer.

The diversity identification was done in groups by listing down what are the main uses of each utility. An example is shown in figure 5. In this example, participants listed the use of water as for drinking, cooking, taking a bath, and washing clothes.

Male

Diversity analysis

Topic: WATER Group: PINK

RANKING	DRINKING	COOKING	TAKING BATH	WASHING CLOTHES/OTHER	TOILET	FOR THE PLANTS
1	2 3 4		1			
2		1 2 3 4				
3			2 4	1 3		

Figure 5 Diversity identification sheet

System mapping

Participant's literacy on their water, waste, and energy systems were observed by asking them to draw a map of their neighborhood that explains the flow of each utility. For example, where the waste is coming from, what kind of activities in their house produces waste and where waste is going. They had to do this activity in groups so that they were able to brainstorm and analyze the systems within their vicinity. The point of this activity is not to measure how correct the results are. Instead, we would like to trigger participants in recalling and to increase the awareness of their environmental system. Time allocated for this activity was about 25 minutes and at the end of the session, each group has to present the results to the other groups. Figure 6 shows a male group representative giving presentation on their system mapping result.



Figure 6 Participants explaining the environmental system of the island's vicinity

Availability, Affordability, and Quality Assessment

After participants refreshed their minds about how the system works and which topics have higher priorities in their life, they were asked to vote on the availability, affordability and quality of the identified topics of priorities. Three posters were used for each priority topic, one for availability, one for affordability, and one for quality. Figure 7 shows the questions framework of this session. Basically, each person was asked to rate how satisfied he or she with the condition of the topics they prioritized in the previous section.

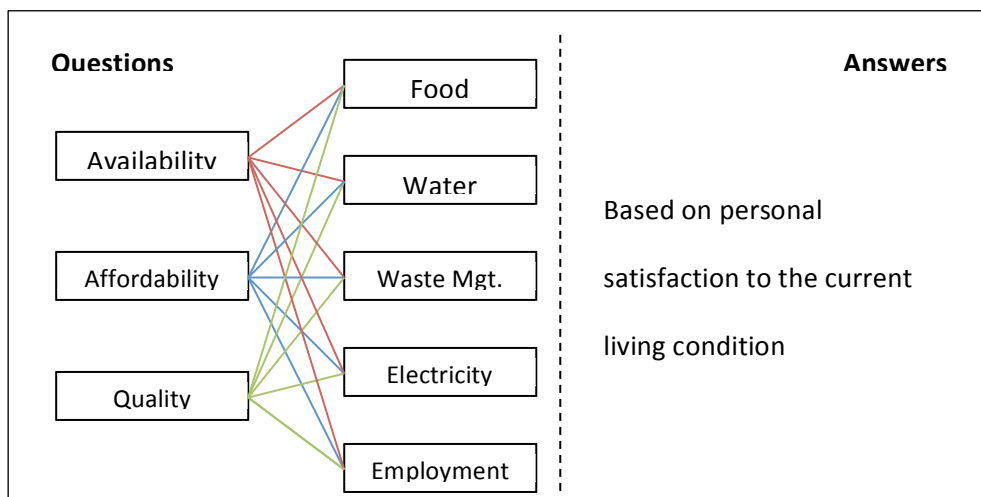


Figure 7 General question framework for availability, affordability, and quality assessment

Challenges Identification

To identify the existing challenges in the community, each person was asked to write down on different colored piece of papers about the water, waste, transportation, health and energy issues and then reading it to everyone. However, the male participants felt that writing is too demanding and their fingers actually hurts from writing because it is not what they are used to be doing on their daily activities (mainly fishing). Since the workshop should be flexible and adjusted to the style where the people feels more comfortable with, participants were allowed to discuss in groups and then a group representative deliver it in front of the other participants orally.

Goals identification

After challenges have been listed on the board for everyone to see, the possible goals were identified. As an experiment, the process of identification was different in the female group and the male group. In the female group, the organizers and facilitators tried to predict what kind of goals would be desired based on the identified challenge, and then the predicted goals were presented to the participants to see whether anyone would debate or support the predictions. During the male group session, the process were by asking directly, "Based on the identified challenges, what kind of goals, 15 years from now, would you like to have?"

Identifying constraints and necessary capacities

Participants were given one night to think over about the challenges and goals that have been identified in the previous sections before moving into this step; identifying constraints and necessary capacities. Everyone had to identify what have been preventing them to have the goals they mentioned and what could possibly help them in achieving these goals in 2015.

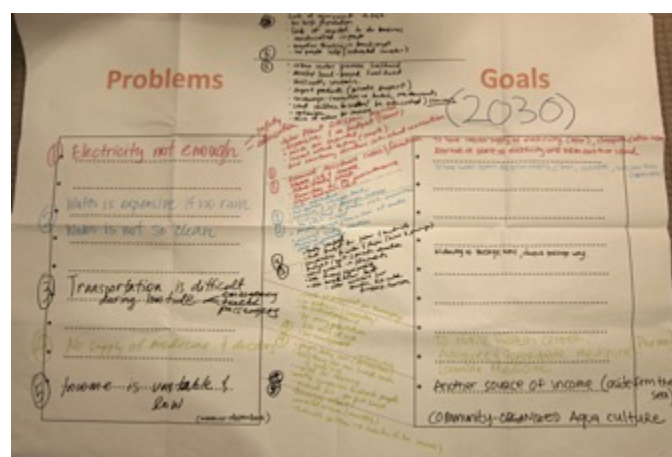


Figure 8 Problems, goals, constraints, and necessary capacities

ANALYSIS METHODOLOGY

The PWS outputs were analyzed using Multiple Correspondence Analysis (MCA). MCA provides useful data visualizations that highlight associations and patterns between several

categorical variables⁶. MCA in this study was applied to see what kind of correlation that the attributes of the participants have with their selected topics of priority. The complete data of participants attribute can be found in the appendixes part of this report. MCA was calculated and plotted with R programming software using FactoMineR and ggplot2 packages.

CHAPTER 3 RESULTS AND DISCUSSIONS

IDENTIFIED PRIORITIES IN CORRELATION WITH PARTICIPANTS' ATTRIBUTE

Each participant was asked to choose his or her top 3 priority topics. The results voted by the male and female groups are shown in figure 9. The female group feels that water is the most important topic, followed by employment and food. On the other hand, the male group feels that energy is the most important topic, followed by water and "other" topics. The "other" topic voted by the male group is mainly on health and transportation. Different with our Surabaya sample, the Pangan-an island male participants do not relate "employment" with income because employment implies a state of being employed by someone. Most of the male in our Pangan-an island workshop is a fisherman, in other words, they are self-employed. The terms that they could relate to income are "health" and "transportation" because they need to be physically fit to be able to fish and they need the boat to go to the sea.

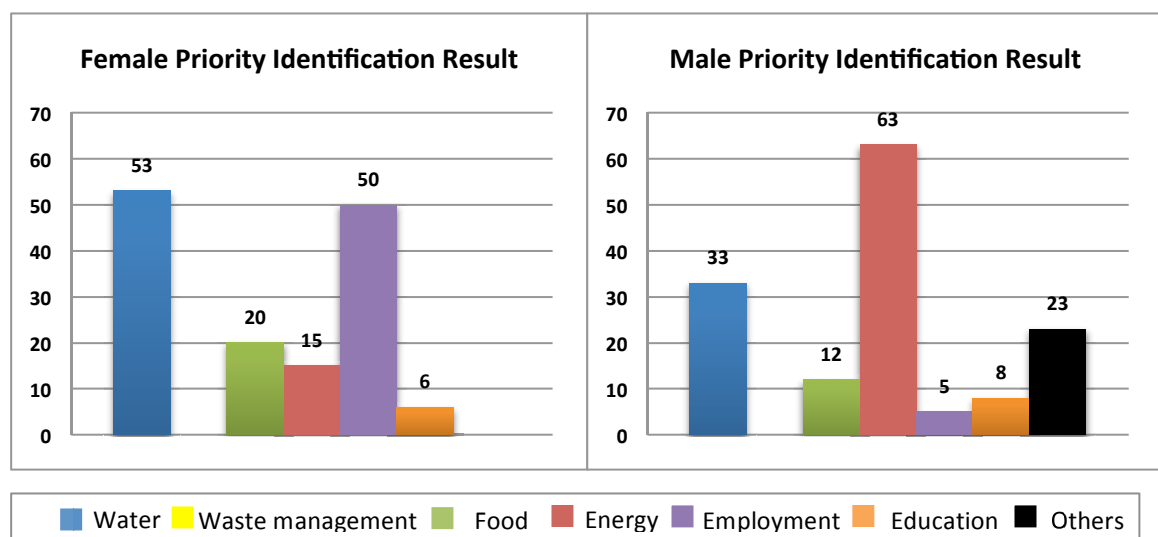


Figure 9 Priority identification result

MCA was conducted by using the attributes summarized in table 2, table 5 and answers shown in figure 9. The complete list of the participants' attributes is available in the appendixes. The topics that the participants have to select from are water, waste management, food, energy, employment, education, and "other". The attributes collected from the participants are as summarized in the left column of table 5. To many of our participants, it was their first time writing down their income and expenses. Many also

⁶ (Greenacre & Blasius, 2006)

realized that their expenses are actually larger than their income. Because of this, they usually have debt due to loaning some money from relatives and friends.

Table 5 Variables used in MCA

Participants attributes	Priority topics
Age	Water
Gender	Waste Management
Number of children	Food
Number of household member	Energy
Education	Employment
Job	Education
Marital status	Others
Income	
Rent	
Water	
Electricity bill	
Food expenses	
Transportation expenses	
Telecommunication expenses	
Child Education expenses	
Loan	
Energy expenses	
Others	

Different combinations of attributes were tested to their answer on priority topics. The combination that shows the most significant result is “Your Last Education”, “Number of Household members”, and “Job”. The male group MCA result in figure 10 shows that those who went to college put their first priority on education. In a descendent manner, those who went to high school put education as their 2nd priority and many of those who went to elementary school has large number of household size such as 8 and 9 people. One way to interpret this finding is that, those who went to college has enjoyed enough education to be capable of earning through activities other than fishing. The male person who went to college is trusted to run the barangay office where the only computer available in the island is located in. On the other hand, due to expenses required for paying school for education, only a limited number of children from each family could actually finish a higher education. The larger size of household has less children finishing higher education. The issue of family planning is also quite apparent in the island. Many families are with 4 or 5 children because female give birth at a relatively young age.

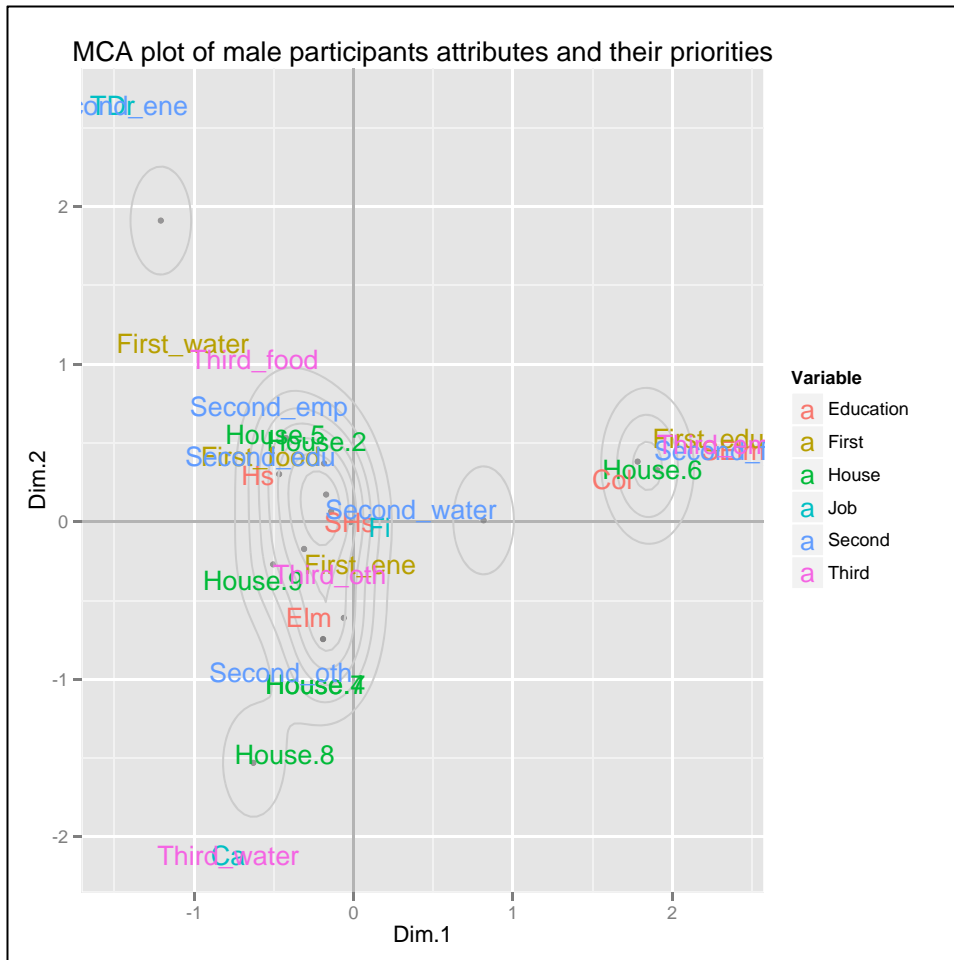


Figure 10 MCA plot of male participants priority

Similar to the male group, combinations of attributes and variables were plotted by R with the MCA packages. The combination that show the most significant result was “education”, “number of household members”, and “job” and the participants answers on their priority topics. The result of the MCA plotting from the female group in figure 11 shows that those who voted education as their 1st priority has a large number of household members (7) and did not finished her elementary school. One way to interpret this finding is that the women who could not finish her elementary schooling wished that they had been able to finish them. A lady was interviewed about why she voted education as her first priority. She said that she does not have a husband and she does not have any income but she has children. Therefore her only hope was her children. If the children would get enough education to earn a decent job, she hope that it would be the family’s way out of poverty. That is why she chose education as her first priority. Another finding from the MCA figure is that those who had finished high school education feels that employment is the number 1 priority, whereas those who only finished elementary school voted water as their first priority. Further inspection of the school textbook materials would be required before we could make any assumption out of these findings.

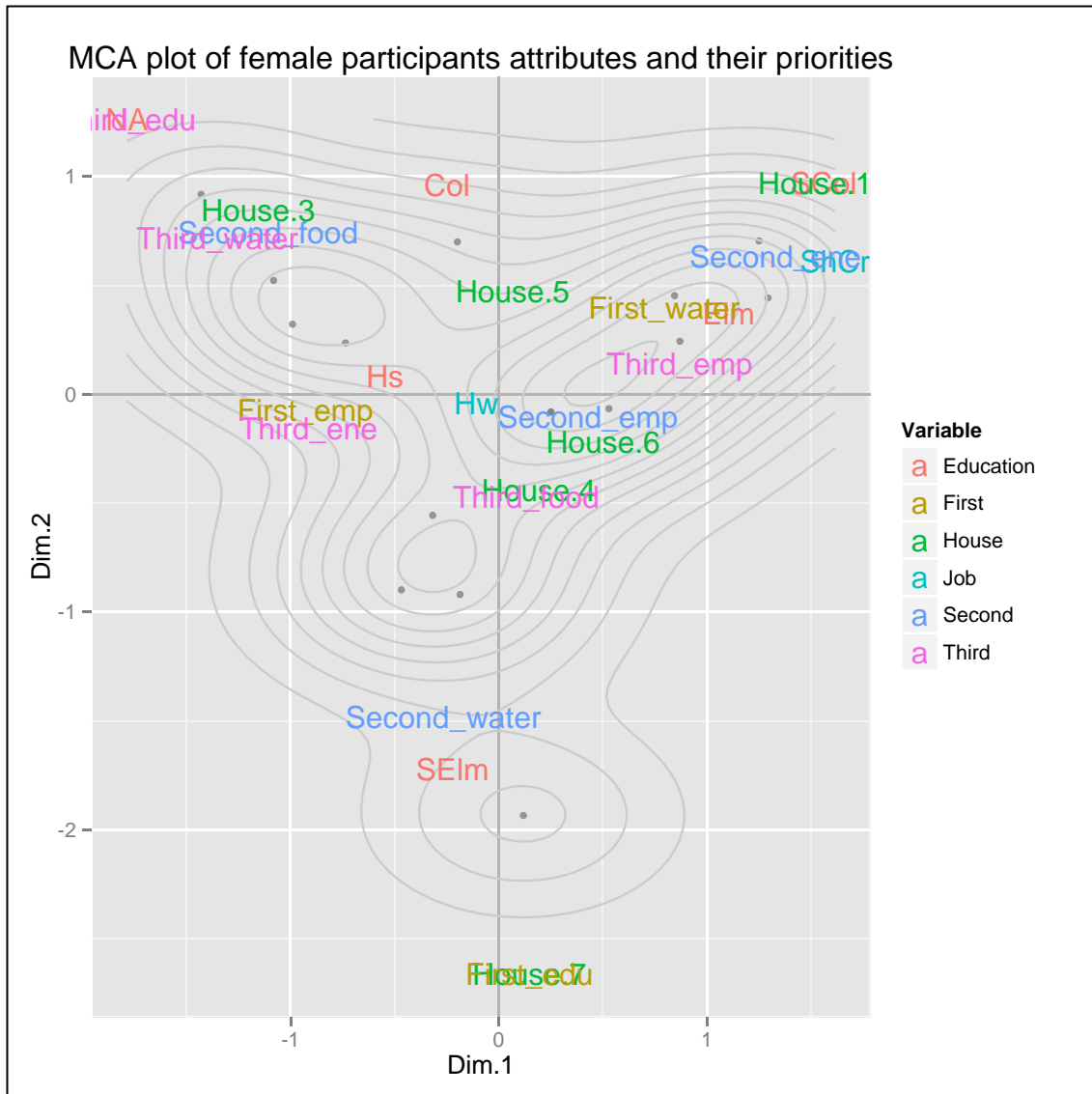


Figure 11 MCA plot of female participants priority

AVAILABILITY, AFFORDABILITY, QUALITY ASSESSMENT

WATER

Water source of the Pangan-an Island is mainly the rain. When there is no rain, there is no consumable water available. Rainwater catchment is installed in some rooftops of the Pangan-an Island residents. A collection pipe on the rooftop, directs rainwater directed to the storage tank located next to the house. A storage tank is too expensive for many households to afford (about 1000 PHP, the average income is 2600 PHP). Therefore some people who own a storage tank would actually sell the water to his or her neighbors especially in the dry season. Some of the male participants mentioned that during the election campaign, usually there are donations of water storage tank to several households in the Pangan-an Island. However, this practice is very limited and only the political allies of the politician running for election would receive such donation.

The use of water is mainly for drinking, cooking, washing clothes and to take a bath. There were some concerns raised by the male participants regarding the quality of the rainwater they collected because many of the roofs are made of steel and they have rusted. They are afraid that some of the rusts have contaminated the water so that it might not be suitable for consumption. In general, the female group rated more highly to the availability, quality, and affordability of water compared to the male group. Figure 12 and figure 13 shows the output of water-use diversity, availability, affordability, and quality.

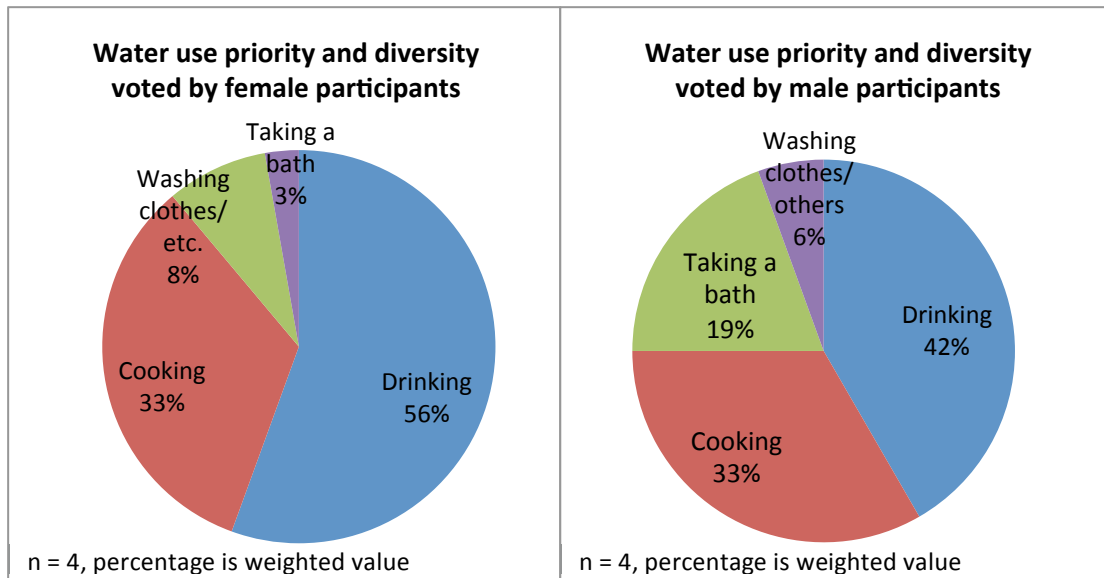


Figure 12 Water use priority and diversity according to the Pangan-an island workshop participants

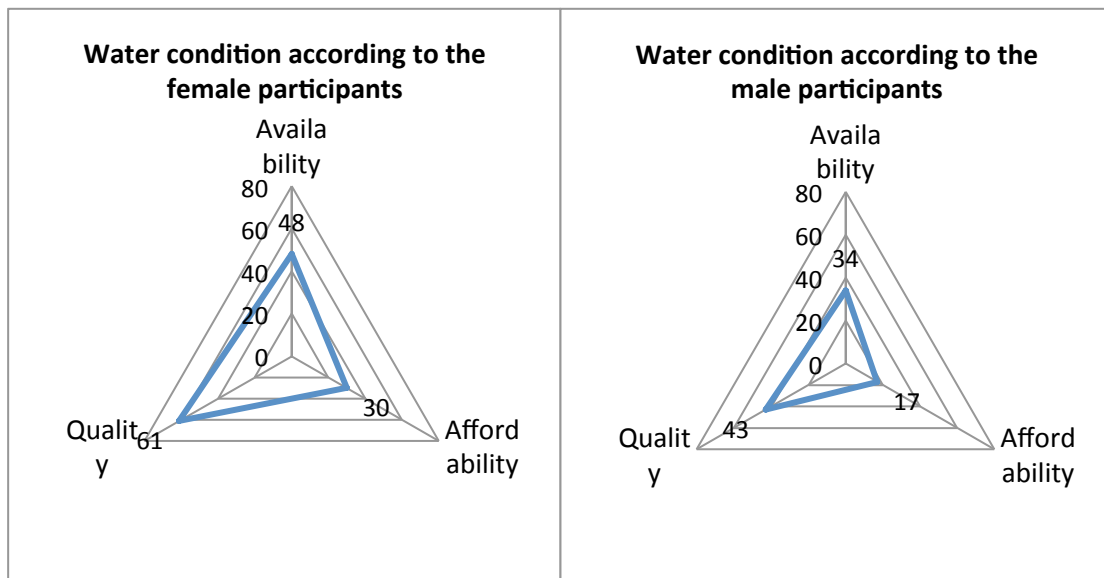


Figure 13 Water condition according to the Pangan-an island workshop participants

ENERGY

In figure 14, we can see that the Pangan-an island use of electricity is mainly for lighting, to run the pump boat and to turn on the radio and TV. It was interesting to see that lighting has higher priority than the rest, considering pump boat is actually the one that is crucial for fishing, thus to earn a living. When we asked the reason of putting light as first priority, they said light is important for their children to study. It is also interesting to see that the female put pump boat as the second priority considering that fishing is actually done by the men in the island. Our female participant mentioned that it is important because the men are the one who brings income and it is only possible when there is fuel to run the pump boat. People in the urban may relate TV and radio as entertainment purpose, but in Pangan-an island, TV and radio are important because they need to know about the weather forecast and any warning on storm to decide whether they should go for fishing or not. They also need to be well prepared because living in such a small island is very sensitive and vulnerable to any changes in weather and temperature.

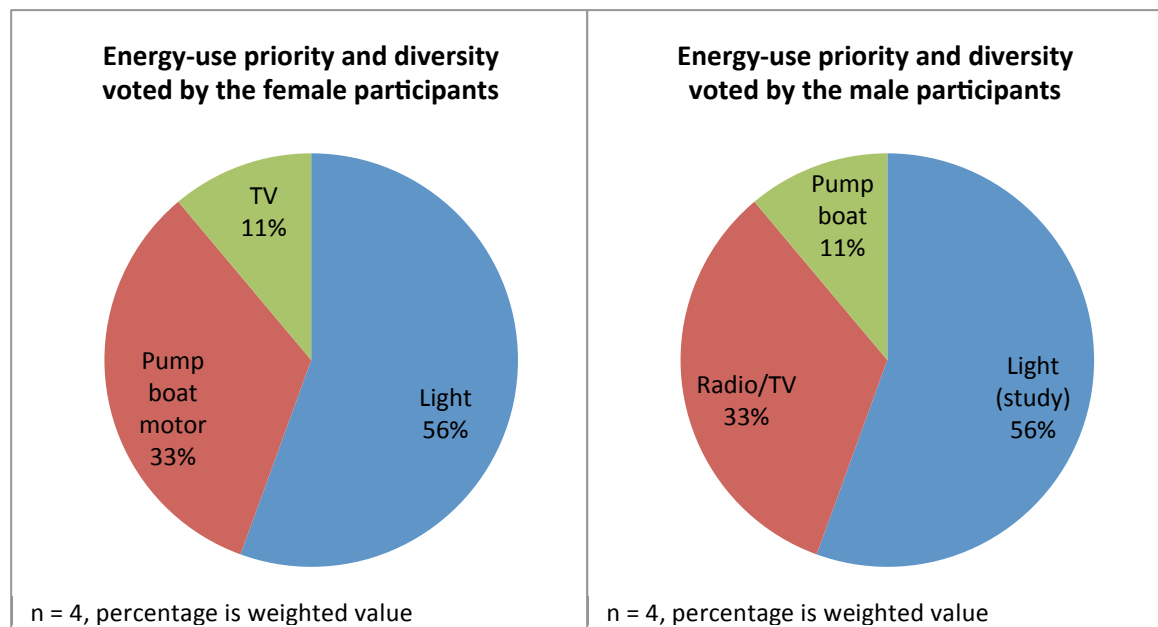


Figure 14 Energy-use priority and diversity according to the Pangan-an island workshop participants

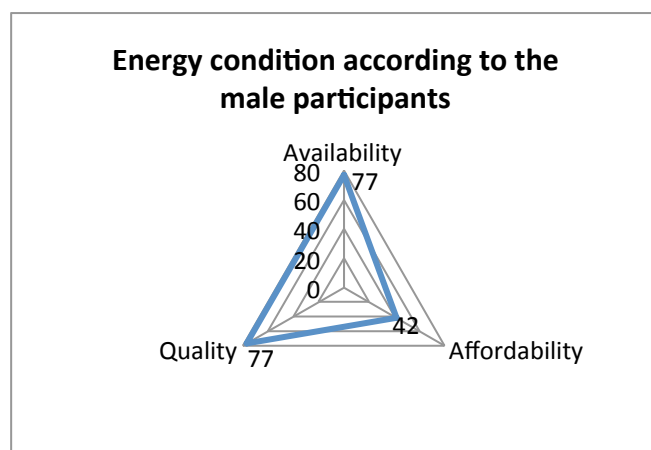


Figure 15 Energy condition in the Pangan-an island according to the male participants

FOOD

The staple food in Pangan-an Island is the yellow corn. The locals call it as simply “yellow” because there are two types of common corn in Cebu; the yellow one and the white one. The white one is more expensive than the yellow one so that people usually buy the yellow corn in bulk. Fish is the dish that people of the island can have access to very easily because of the fishing activities. Vegetables are bought from the main island. When we asked why they do not plant vegetable in the island, the participants said that the island is rather rocky therefore it is not suitable for the island. Female participants selected food as the third most important topic. On the other hand it did not appear in the three top priorities voted by the male participants. We assume that because majority of the female are housewives, they are more in touch with food preparation for the family; therefore they feel more importance towards food. Our female group felt that the availability, affordability and quality of the food are acceptable. Although diversity is not so high, everything is available fresh. Unlike our Surabaya case study, nobody is concerned about additives or the safety of processed food because food material is produced locally and unprocessed. Figure 16 shows the summary of food condition in the Pangan-an Island according to our female participants.

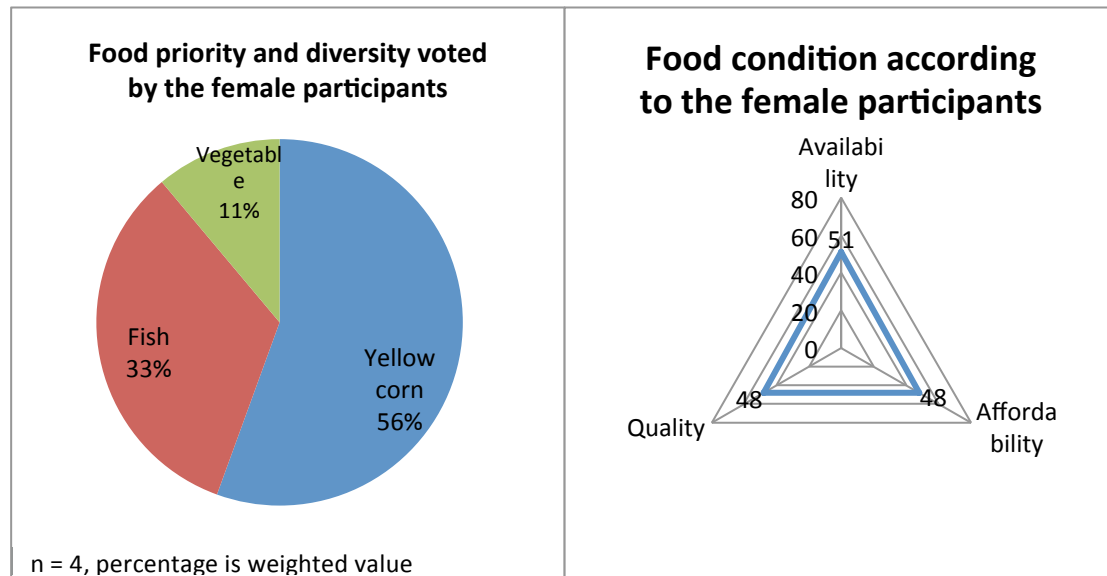


Figure 16 Food diversity and condition according to the female participants

JOB

The idea of income earning was presented differently in the female and the male groups. The word employment was used in the female group, while in the male group, in addition to employment; the word health and transportation were also presented as topics they can choose their priority from. It turned out that the male group associated health and transportation better with earning an income.

Employment is the second priority voted by the female group. Initially, the female group could not relate their role as taking care of the house and children as “employment” and they wanted to fill the “job” section as “none”. But after being encouraged that “housewife” is actually an activity that contributes to the quality of a household, they put “my job” as the first priority in the family. This was also because some of the women do not actually have

husband although they have children. Some of our female participants actually make handicrafts from the shell that they collected from the beach. But they do not see it as the main source of income. In terms of opportunity, salary, and working condition, opportunity has slightly less score than the salary and working condition.

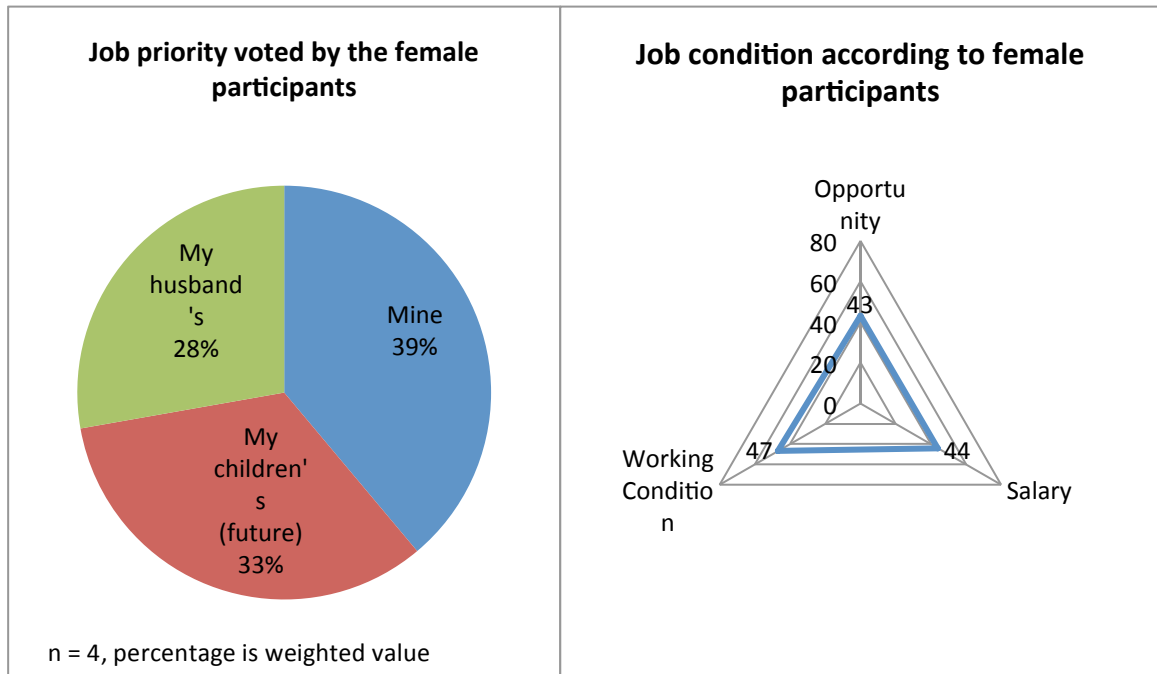


Figure 17 Job priority and condition according to female participants

The male group felt that if income earning does not have to be too much dependent on the sea and the weather, they would have a better and stable income. However, many are afraid to start such kind of business because they are lacking of the required skills and capacity to be an entrepreneur.

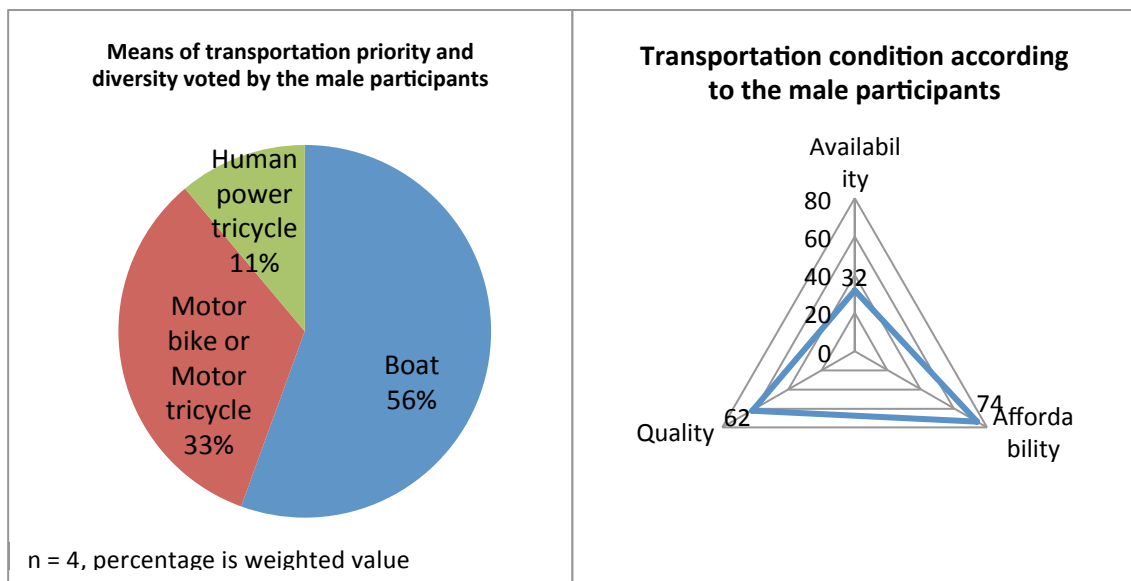


Figure 18 Transportation diversity and condition according to the male participants

Transportation and health are the topics that are voted as highly important by the male group. The sum of these two topics made up the third most important issue according to the male group. Boat is the main transportation means used by the resident of Pangan-an island because people need to fish to the sea as well as go to the main island, lapu – lapu city to sell the catch. The common problem with boat transportation is both infrastructure-wise and the financially. Due to the shallow water, often the boat is unable to move especially when the tide is low. Financially, often the boat do not have enough passengers for the fuel to be paid-off, therefore people need to wait longer until the boat meets the minimum capacity. The second mean of transportation is motorbike or motor tricycle; these are mainly the land transportation that people use in the main island to get around buying necessities. The third one is human power tricycle; this type is available on the island. Although the Pangan-an Island itself is not so big, but during the low tide it is actually possible to go to the nearby island, Santa Rosa, because they are actually used to be one big island, the Olango island wildlife sanctuary.

In terms of health, the male participants feel that their health is most important among members of the household because if they fall sick, they could not go fishing and it would be hard for the family to survive financially. There was no clinic or pharmacy available in the island, therefore, if someone gets sick or if a woman needs help in delivering a child, it could be very challenging. There is no one from the island who has become a nurse or a doctor as the cost for a nurse school is too high, 30,000 PHP per semester. That is close to one year of earning of a father in Pangan-an Island.

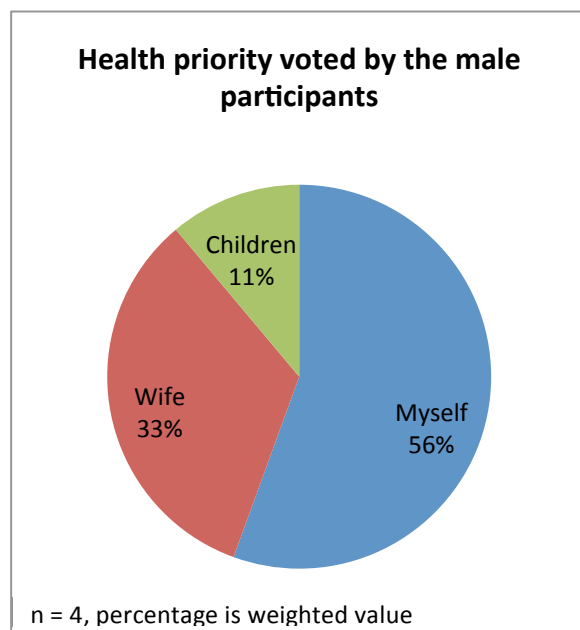


Figure 19 Health priority voted by the male participants

SYSTEM LITERACY

Participants were asked to draw on a piece of paper about the flow of water, food, energy, and waste in the Pangan-an Island. An interesting thing found during the activity was that every male group would start drawing from an upper corner of the paper, and it was always the sun. This is consistent with their first priority as the energy. In general, the male group

has more comprehensive drawings compared to the female one. But all of them were able to identify where water, waste, and energy are coming from and where they dispose the waste.

CURRENT CHALLENGES AND FUTURE GOALS

The summary of challenges, goals, necessary capacities and constraints identified by our participants is presented in table 6. Both gender groups mentioned about water unavailability during the dry season, income dependency on the sea and weather, the deteriorating solar plant, and low access to the main island. The male group brought up the issues of possible drinking water safety problem and inexistence of health center. On the other hand, the female group brought up the issues of poor diversity of affordable food. In general, the female group was able to describe the problems in details but could not propose equally detailed solution. On the other hand, the male group stated the problems in a concise manner but were able to propose very detailed and various solutions. (see appendix: forced fields analysis posters). A positive impression from both genders is that both sides are thinking about the issues faced by the other gender. For example, the female groups also share the importance of sea-road access although the men are the main user of the boat. On the other hand, the male group wished for a cooperative that could organize the shell-craft industry so that a bigger margin of benefit could be gained by shell-crafter that is mainly the women.

Table 6 Outcome of problems, goals, necessary capacities and constraints as identified by both genders

Female			
<i>Current problems</i>	<i>Future goals</i>	<i>Necessary capacities</i>	<i>Constraints</i>
Water is not available during the dry season	Each household should have water container and rain collector	Financial management skills and outside supports including: daily savings, loan, and donation	Lack of budget for cement, and workers. Donation is usually given to political allies.
Income is insufficient and highly dependent on the sea	To have community livelihood program	To make water selling business by using plastic drums	Land ownership does not allow to alter the land, lack of organizational skills and competition in capital lending
Only low quality food is affordable	To have a shell craft cooperative	To look for work/business opportunities outside the island and strive to save for capital	
Solar plant is deteriorating	To have a new solar plant	Proper management of solar panel	Lack of budget, high maintenance cost, community savings were loaned out
Electricity is expensive and not sufficient			
There is no sanitation facility	To have toilet in each house, garbage disposal and recycling site	To gain skills on waste management and recycling	Land does not allow to have toilet (rocky), lack of priority (the sea is always there), expensive capital to build
Low access to the main island	Better sea-road access	Capital and persistence to build a better sea-road access	No organizers and now budget

Male			
<i>Current problems</i>	<i>Future goals</i>	<i>Necessary capacities</i>	<i>Constraints</i>
Electricity is not sufficient	To have regular supply of electricity (24hr), cheaper (within income reach) and alternative source of electricity	To have rehabilitation of the solar plant, know how of PV maintenance, knowledge of proper usage of electricity	New battery is not affordable, the existence of bird sanctuary prohibit getting electricity from the other island
Water is expensive during the dry season	To have water system: regular supply, cleaner, cheaper, safer, new technology (desalination)	Establishing sinking fund to make pipe connection to other island	Water tank is not affordable
Water quality is questionable		To learn about the proper usage of water	
Transportation is difficult during low tide	Widening and deepening of the passage way	To build cooperation to widen and deepen the passage way	The rocky seabed, lack of budget and
Inexistence of regular health services	To have a health center, adequate and affordable pharmacy	Proper body care, capital for pharmacy, monthly symposium to educate people, medical kit, barangay effort, medical mission, educate children	No capable personnel or equipment for a health center
Income is dependent on the sea	Another source of income (aside from the sea)	To get livelihood from the urban sector, develop land-based livelihood, make shell-craft and souvenirs, export products to get private supports, encourage investors to make hotels and restaurants, send children to school, have business skills trainings	Lack of capital and skills to start a new business

THE WAY FORWARD

The analysis of an off-grid Island community, Pangan-an Island of Cebu Province in this study shows that the issues of water, energy, food, and capacities to earn an income are the top priority topics for the community. There is a strong desire to have a more stable income through a land-based livelihood from both gender groups. They also wished for more connectivity to the main Island as well as regular supply of consumable water and electricity.

Affordable education for children is a key factor that the community wished to be able to escape from poverty. To facilitate families in improving affordability to education is perhaps a stronger policy and socialization about family planning and knowledge and skills on financial management.

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APPENDIXES

LIST OF PARTICIPANTS' PROFILE

Summary of Participants Profile: Pangan-an island, Lapu Lapu City, Cebu

Marital Status	Number of household member	Number of Children below 17	Monthly income (PhP)	Monthly rent	Water bill average per month (PhP)	Electricity bill average per month (PhP)	Other expenses						
							Food	Transportation	Communication	Education	loan/Lending	Kerosene/gas / wood	Health
Married	3	1	2000	0	800	270	2910	200	52	150		60	
Single	3	2	0	0	1500	270	7830			460		600	
Married	3	1	0	0	700	270	2250	100	24	160		60	
Married	4	6	0	270	900	270	4000			300			
Single	3	2	1200	0	450		1800	1176		150		330	
Married	4	2	300	0	450	375	3900			600	300	150	
Married	6	4	0	0	450	375	4800		26	900	1500	150	
Single	6	1	1200	0	450	295	3600			300		415	
Married	4	1	300	0	465	300	3286					300	500
Married	12	1	0	0	525	400	3390	120				1660	3200
Married	5	3	0	0	465		3596					150	550
Married	6	4	1200	0	480	270	6150			480	700	350	
Married	5	3	0	0	600	270	2620				900	450	300
Married	4	0	600	0	300		2350					150	
Married	7	3	600	0		500	5000			2500		500	
NA	6	NA	0	0	840	270	3060				750	400	
Married	5	3	3000	0	500	305	5940	100		300		150	
Married	5	3	3500	0	500	750	8820	150	30	800		150	
Married	8	4	8200	0	512	400	6600	120		600		90	
Married	6	4	3000	0	600	400	2160	1000	100	300		150	
Married	6	4	6500	0		250	3700	1100	184	300	900		200
Married	8	6	5500	0	200	270	3360	2250	150			1050	180
Married	5	3	6600	0	240	295	5300	100	100	300			100
Married	9	1	5800	0	900	250	2340	120		30		900	675
Married	4	2	2500	0	600	250	1500	400		300	1800	300	100
NA	7	3	4500	0	450	270	3645	100			300		150
Married	5	3	3000	0	460	NA	3054	200		80	300		150
Single	2	0	2500	0	450	NA	1800	100		0	900	150	
Married	6	4	6000	0	600	270	1500	150		350	600		450
Married	5	3	6000	0	800	270	3300	210		30	600		3000
Single	5	3	6000	0	120	250	4050	306		330	1300		120
Married	5	1	4500	0	120	300	1640	270		200	600		140

Figure 20 Participants profile

QUALITATIVE WORKSHOP ACTIVITIES OUTPUT





Participant number	Water	Waste Management	Food	Energy	Employment	Education	Others
F1	1		3		5		
F2			3		5	1	
F3			3	1	5		
F4	3		1		5		
F5	5		3		1		
F6	5		1		3		
F7	5		1		3		
F8	5		1		3		
F9	5			3	1		
F10	5			3	1		
F11	5			3	1		
F12	5			3	1		
F13			3	1	5		
F14	3			1	5		
F15	3				1	5	
F16	3		1		5		
Total	53	0	20	15	50	6	0

Water		Employment		Food		Energy	
usage	importance	whose	importance	kind	importance	kind	importance
Drinking	20	Mine	14	Yellow corn	20	Light	20
Cooking	12	My children's (future)	12	Fish	12	Pump boat motor	12
Washing clothes/etc.	3	My husband's	10	Vegetable	4	TV	4
Taking a bath	1						

Participant number	Water			Employment			Food		
	Availability	Affordability	Quality	Opportunity	Salary	Working Condition	Availability	Affordability	Quality
F1	4	2	3	3	3	3	4	4	3
F2	3	2	3	3	3	3	4	3	3
F3	3	2	3	3	3	3	4	3	3
F4	2	1	4	2	3	3	3	2	3
F5	3	2	4	3	4	3	3	3	3
F6	3	2	4	3	4	3	3	3	3
F7	3	2	4	3	4	3	3	3	3
F8	3	2	4	3	4	3	3	3	3
F9	3	2	4	3	2	3	3	3	3
F10	3	2	4	3	2	3	3	3	3
F11	3	1	4	3	2	3	3	3	3
F12	3	2	4	3	2	3	3	3	3
F13	3	2	4	2	2	3	3	3	3
F14	3	2	4	2	2	3	3	3	3
F15	3	2	4	2	2	3	3	3	3
F16	3	2	4	2	2	3	3	3	3
Total	48	30	61	43	44	47	51	48	48

Participant number	Water				Employment				Energy				Food										
	Drinking	Cooking	Washing clothes/etc.	Taking a bath	Toilet	Agriculture	Mine	My husband's	My children's (now)	My children's (future)	Radio	TV	Computer	Light	Electric fan	Pump boat motor	Yellow corn	Fish	Vegetable	Shall	Crab	Chicken	
F1	5	1	1																				
F2	5	1	1																				
F3	5	1	1																				
F4	5	3		1																			
F5							3		6														
F6							3	5	1														
F7							5		1														
F8							5		4														
F9											1			5		3							
F10											1			5		3							
F11											1			5		3							
F12											1			5		3							
F13																	5	3	1				
F14																	5	3	1				
F15																	5	3	1				
F16																	5	3	1				
Total	53	12	3	1	0	0	14	10	0	10	0	15	0	0	0	6	20	12	4	0	0	0	0

Figure 21 Female answers quantified output

Participant number	Water	Waste Management	Food	Energy	Employment	Education	Transportation	Health
M1	5		1	3				
M2			5			3		1
M3	1			5			3	
M4	3				1	5		
M5			3	5	1			
M6	3			5				1
M7			1	5	3			
M8	5						3	
M9				5			3	1
M10				5			3	1
M11	3		1	5				
M12	3		1	5				
M13	3			5				1
M14	3			5				1
M15	3			5				1
M16				5				3
Total	32	0	12	63	5	8	12	10

Energy		Water		Transportation		Health	
usage	importance	whose	importance	kind	importance	kind	importance
Light (study)	20	Drinking	15	Boat	20	Myself	20
Radio/TV	12	Cooking	12	Motor bike or Motor tricycle	12	Wife	12
Pump boat	4	Taking a bath	7	Human power tricycle	4	Children	4
		Washing clothes/others	2				

Participant number	Energy			Water			Transportation		
	Availability	Affordability	Quality	Availability	Affordability	Quality	Availability	Affordability	Quality
M1	5	2	5	1	1	2	2	2	4
M2	5	4	4	1	1	2	2	2	4
M3	5	2	5	1	1	2	2	2	4
M4	5	4	5	1	1	2	2	2	4
M5	5	5	4	2	2	1	2	2	4
M6	5	2	5	4	1	4	2	2	4
M7	5	4	5	4	1	4	2	2	4
M8	5	2	5	4	1	4	2	2	4
M9	5	2	5	1	1	4	2	2	4
M10	5	2	5	1	1	4	2	2	4
M11	5	2	5	1	1	4	2	2	4
M12	5	2	5	1	1	2	2	2	4
M13	2	4	3	4	1	2	2	2	2
M14	5	2	5	1	1	2	2	2	4
M15	5	2	5	1	1	2	2	2	4
M16	5	1	5	4	1	2	2	2	4
Total	77	42	77	34	17	43	32	74	62

Participant number	Water					Transportation				Energy					Health						
	Drinking	Cooking	Taking a bath	Washing clothes/others	Toilet	Plants	Boat	Motor bike or Motor tricycle	Wike	Human power tricycle	Light (study)	Radio/TV	Pump boat	Light (fishing)	Light (cooking)	Gas/wood (cooking)	Myself	Wife	Children	Mama	Father
M1		1	1	1																	
M2		3	1	1																	
M3		3	1	1																	
M4		3	1	1																	
M5							3	3		1											
M6							3	3		1											
M7							3	3		1											
M8							3	3		1											
M9										3	3	1									
M10										3	3	1									
M11										3	3	1									
M12										3	3	1									
M13																	3	3	1		
M14																	3	3	1		
M15																	3	3	1		
M16																	3	3	1		
Total	15	12	1	1	0	0	30	30	9	4	30	12	4	0	0	0	31	31	11	0	0

Figure 22 Male answers quantified output

FORCED FIELDS ANALYSIS POSTERS

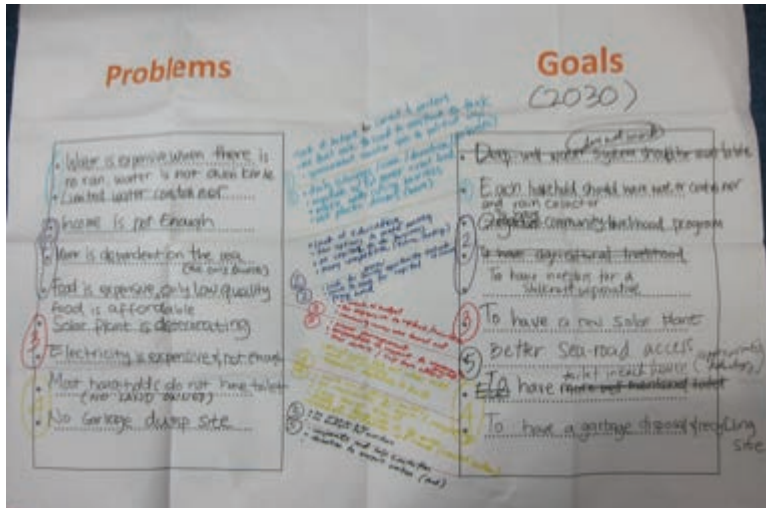


Figure 23 Challenges, goals, and required capacities poster from the female group

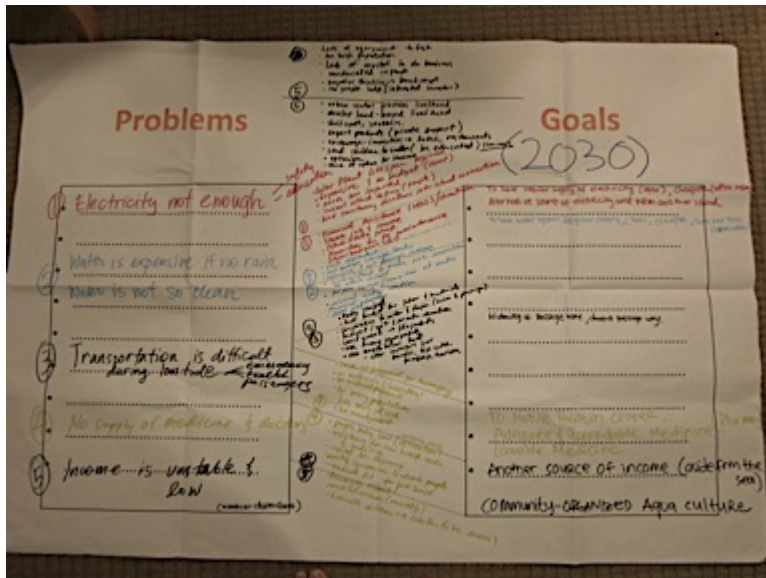


Figure 24 Challenge, goals, and required capacities poster from the male group