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Rainwater Harvesting Practices and Utilization in the Island of Malangabang Philippines

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ABSTRACT

Water supply is a problem to humanity. In fact, with the increasing population of the world, the need and demand for water is growing that includes rainwater which is significant to every living specie including the environment, (Sadia Rahman, 2014). With this, rainwater harvesting came into being to many households so with the island of Malangabang in the Philippines where water supply is threatened with climate change, snowballing population, water sourcing, and environmental issues. Using the descriptive type of research utilizing a survey method colored with random interview, the study on Rainwater Harvesting Practices and Utilization was conducted in the island. Furthermore, it was confirmed that the rainwater was harvested primarily from the rooftop and the least excess water from grounds and plants. In terms of utilization, it was manifested that rainwater was used for watering the plants, toilet cleaning and flushing and the least is utilized for drinking. It is evident that significant relationships between practices and utilization were "sourced from the rooftop and personal washing and cleaning; house gutter and utilized from bathing of pets; used containers and cooking; other households cleaning and for drinking" respectively. This supports the study of Gupta & Chakraborty (2021) declaring that rainwater harvesting augments water shortage where its uses may include water for gardens, livestock, irrigation, domestic use with proper treatment, and indoor heating for houses among others. Moreover, the harvested water can also be used for drinking, bathing, and for other purposes where humans especially in communities where supply and source of water is scarce. The results of the present study imply that the practices manifest a purposive rainwater harvesting which sets an impression for a special driven purpose of utilization to the island community where designing rainwater harvesting infrastructure is recommended.

***Keywords**: Rainwater harvesting, practices, utilization.*

1. INTRODUCTION

Water is considered as an interminable free source that can be acquired naturally. Due to an increasing population, the demand for processed supply of water is growing higher including rainwater, (Sadia Rahman, 2014)

Rainwater harvesting is the accumulation and deposition of rainwater for reuse. It is also a practice of collecting rainwater for use either indoors or outdoors. This may consists of prepared porous ground surfaces or via subsoil drainage from turf areas collected from dew or fog with nets or other tools, rivers or roofs, and in many other places.

Rainwater is very useful to humans, animals and environment. Its uses may include water for gardens, livestock, irrigation, domestic use with proper treatment, and indoor heating for houses among others. The harvested water can also be used for drinking, bathing for other purposes where humans especially in communities where supply and source of water is scarce (Gupta & Chakraborty, 2021).

The ancient Romans built houses with rooftops specifically designed to catch rain and store it for general household use. The advent of central pressurized water supply systems largely did away with the need for rainwater harvesting in urban areas as people became accustomed to water on tap as the norm. (Dowds & Penfold, 2007).

In some countries rainwater harvesting provides an important solution to reducing the environmental impact of urbanization, industrialization and a cost

effective way of reducing the need for a central infrastructure to supply water to all the inhabitants.

Households nowadays are so dependent with the water system supplies where incrementally it fails to supply the enough and apposite amount in accordance to the populace needs. This then becomes an issue, in fact a problem in both rural and urban areas in the country so with the island of Malangabang where water supply is now threatened.

It is undeniable that there are still that are left behind on this great challenge of the environment- the rainwater harvesting, where the marginalized, the people in the island of Malangabang who once a victim of typhoon Yolanda forcing themselves to rise where the only source of income is primarily fishing.

To run into the challenge on capturing rainwater runoff from rooftops, local catchments and other methods of conserving water through rainwater management and to help reduce seawater ingress in coastal areas like in the barangay island, a study on Rainwater Harvesting Practices and Utilization in the Island of Malangabang, Concepcion, Iloilo is conducted.

1.1 Objective of the Study

The purpose of this study was to determine the Rainwater Harvesting Practices and Utilization in the Island of Malangabang Concepcion Iloilo Philippines.

This study specifically sought to determine:

1.1.1. the rainwater harvesting practices of the people in the island;

1.1.2. harvested rainwater utilization of the respondents in the study;

1.1.3. if significant relationship existed between rainwater harvesting practices and utilization of the respondents of the study.

1.2 Conceptual/Theoretical Framework

Theories on Ecological Modernisation (EM) and Diffusion of Innovation (DI) were utilized in this study. The theories are completely sharing the paradigm of structural functionalism, emphasizing logical and positive and experiential; a highly effective way of organizing structural and cultural elements in their effects on consumption considering across range of DI research.

Rainwater Harvesting Principles by Richard Hammon (2011) was utilized in this study. He stressed that rainwater harvesting offers environmental benefits of water conservation in buildings and opportunities for rainwater utilization indoors & outdoors can lead to system design considerations (Hammon, 2011).

1.3 Definition of Terms

Rainwater Harvesting. In this study, the term refers to the rooftop rain harvesting practices of the population in the island. Practices. As implied in this study, the term refers to actual behavior towards rooftop rain harvesting as well as the use of available rooftop rain harvested. Utilization. This is how the population of the island made use in any form of the harvested rain of the population.

1.4 Significance of the Study

This study is significant to the following: To the Island of Malangabang. The results of the study will greatly benefit the island's populace as to their management of rainwater harvested from their rooftops. To the Municipality of Concepcion. The study will serve as a basis for conducting a seminar on rooftop rainwater in the different barangays in the municipality. To the Iloilo Science and Technology University. This study can be included as part of an outreach program and actual research of the College of Education faculty. To the Province of Iloilo. The establishment of water utility infrastructure in the island could be a pilot model of establishing the same to other islands primarily in Iloilo Province.

1.5 Scope and Limitation of the Study

The parameters of the study are the following: The study was conducted to the respondents in the island of Malangabang. This is limited to the lived experiences on rain harvesting practices and utilization of the population. A researcher made instrument was the basis in gathering the data. Appropriate statistical tools were utilized for the analysis of data utilizing SPSS.

2. REVIEW OF RELATED LITERATURE

World population growth, climate changes, urbanization, and industrialization have all had a negative impact on natural resources, including water resources. Excessive exploitation and pollution have caused more and more regions to have problems with access to fresh water. Rainwater is perceived as a valuable alternative source of water that is most often used in a hybrid system supplementing tap water (Slys & Stec, 2020).

Water scarcity and stress are reaching worryingly high levels worldwide due to the intensive exploitation and pollution of water resources. Climate change is intensifying this pressure in the many parts of the world, resulting in an infallible decrease in water resources in the coming years (Bates et al. 2008). On

the other hand, the growing population, rapid urbanization, industrialization among others are putting remarkable pressure on water resources availability to a point that faces an extremely low water availability which do not exempt the Philippines' comprising hundreds of islands. Contextualizing the interest in and necessity of the use of alternative water sources rainwater harvesting may be an effective supplementary water source because of its many benefits and affordable costs. (Zavala, Prieto, & Rojax, 2018).

Richard Hammon (2011) stressed that rainwater harvesting offers an environmental benefits of water conservation in buildings and opportunities for rainwater utilization indoors and outdoors, reduce potable water use for irrigation and for toilet flushing.

In many urban places around the world, resources of water obtain their water from great distances however, in some rural areas it does not mean the same. Some of the practices are on dependence on the upper streams of the water resource supply area which is not sustainable and building dams in the upper watershed often means submerging houses, fields and wooded areas.

In the past, it was believed that rainwater was pure and could be consumed without pre-treatment. While this may be true in some areas that are relatively unpolluted, rainwater collected in many locations contains impurities. Particularly during the last three decades, "acid rain" has affected the quality of the collected water, to the point where it now usually requires treatment.

Rainwater quality varies for a number of reasons. While there are widely accepted standards for drinking water, the development of approved standards for water when it is used for non-potable applications would facilitate the use of rainwater sources.

The study on Sustainability of Rainwater Harvesting System in terms of Water Quality Sadia Rahman, M. T. R. et.al. (2014) presented that rainwater harvesting is the most traditional and sustainable method, which could be easily used for potable and non-potable purposes both in residential and commercial buildings. This could reduce the pressure on processed supply water which enhances the green living. Moreover, sustainability of this system through assessing several water-quality parameters of collected rainwater with respect to allowable limits. A number of parameters were included in the analysis. The study revealed that the overall quality of water is quite satisfactory as per Bangladesh standards. RWH system offers sufficient amount of water and energy savings through lower consumption. Moreover, considering the cost for installation and maintenance expenses, the system is effective and economical (Sadia Rahman, 2014).

Research Possibilities in Rainwater Harvesting in Sri Lanka M.D.C. Abhayaratna' revealed that both surface water and groundwater resources of Sri Lanka have been utilized to a large extent and the possibilities of further expanding them are limited. Nevertheless, a considerable amount of water received as rainfall escapes to the sea unutilized and there is a great potential in harvesting this resource for domestic as well as agricultural uses. As rainwater harvesting (RH) on an organized scale is a very recent development in the country, there is a lack of knowledge and information on several aspects of this very useful technology. Hence, many research possibilities exist to make RH worthwhile and acceptable to the people (Abhayaratna', n.d.).

The study of Jean Charles Milagros (2007) stressed that millions of people worldwide suffer from lack of water, the importance of water is well known and the problems facing water sources have been well documented. According to him, there are many factors that compromise quantity and quality of water supply sources in some developing countries. Furthermore, rainwater harvesting, the collection of rain from surfaces upon which it falls, is a long-standing practice of many countries still used as a means for dealing with the water problems of today. Rain is harvested in many ways and is a vital supplementary source of water. His paper defined feasibility in terms of the physical, social, and technical environments of developing countries. More specifically, current water supplies, climate, available resources, cultural preferences, gender roles, community dynamics, supply and demand are defined and evaluated to determine the role each play in sustaining the practice of rainwater harvesting. These criteria are applied mainly to the idea of ground catchments, a rainwater harvesting system common in Mali, West Africa (Milagros, 2007).

Several studies have shown that RWH systems provides avenue for conservation of water, consider potential of rainwater harvesting and the quality of collected rainwater to increase confidence on rainwater use (Campisano, A. *et.al.* 2017). This present study is an answer to this call for it addresses the use utilization of rainwater where the results explicitly declaring the benefits of rainwater to the households in the island where water is scarce.

In Eastern Ethiopia, rainwater was utilized with different purpose particularly on agriculture led to the increase of their agricultural production, which, in turn, reduce risks and deliver positive impacts on other ecosystems and is stressed that the practice of rainwater harvesting may continually improve when technologies and extended services are provided appropriately particularly for farmers *(Temesge, et., al. 2020).* The

practices were behaviorally explicit to the households however the focus of utilization were generally for household use while the reviewed literature is more on agricultural utilization.

Similar to some other studies, countries like in some part of Africa, management strategies have been used in the country to improve rainwater productivity in dryland cropping. Their enhanced levels of mobilization, capacity building, empowerment and community participation translated to the success with rainwater harvesting for crop production which presented the opportunity of upscaling from household food gardens to communal croplands, innovations as a result of capacity building and trainings (Sanewe, A.J. & Backeberg, G.R. 2012). Famin Liu (2005) disclosed that RHA has great potential for enhancing water availability, reducing water loss, producing more with the same amount of annual rainfall and increasing agricultural productivity, improvement of crop yields and water-use efficiency (WUE) with its potential role in alleviating or eliminating poverty and land degradation. Hence, its implementation helped local farmers solve the problem of water shortage and to achieve self-sufficiency in grain.

Rainwater harvesting potential in the area of study in Nigeria potentially met the harvested domestic rainwater, non-potable household water demand and household potable water demand for a six-member household (Idowu, Isaac, 2015). Meanwhile Abeokuta has a mean annual rainfall of 1,156 mm where annually 74.0 m3 of rainwater are harvested per household which sufficiently supply their monthly household water demand for flushing and laundry and to supplement the short fall in the dry months provided however then they have adequate storage (Olanike, *et.al.* 2009). This program is similar to what the present study thought which is to have a second phase to design rainwater infrastructure in the island for a more enhanced harvesting practices adding to it trainings which should be extended to the households for appropriate utilization and understanding of the benefits and hygiene on the use of rainwater.

3. METHODOLOGY

3.1 Research Design

A descriptive research design used in this research endeavor utilized a survey method colored with random interview on practices and utilization of rainwater of the residents. An interview was conducted to enrich the data gathered in this study.

3.2 Respondents of the Study

The respondents of the study were the sample population of household representatives in the barangay island of Malangabang in the municipality of Concepcion, Province of Iloilo. A simple random sampling was utilized via fishbowl method.

3.3 Instrumentation

An adopted – revised modified checklist-questionnaire is the instrument of the study. Part 1 contained the personal profile of the respondents. This served as the researchers' guide in the discussion and analysis of results. The second part was the questionnaire proper that comprised the major parts on rain harvesting practices and its utilization with nine (9) items each with a total of 18 items in general.

3.4 Data Gathering Procedure

To gather the data, the group of researchers conducted the instrument to the household respondents of the study. A help from the barangay officials was also utilized.

3.5 Data Analysis

SPSS was utilized to analyze the data in the study.

4. RESULTS AND DISCUSSION

This chapter presents the analysis and interpretation of data of the study. The presentation and discussions are presented in accordance with the statement of the study.

4.1. On the Profile of the Respondents of the Study

Table 1. Distribution of the Population of the Study

Variables	Classification	F	Percent
Sex	Male	73	32.44
	Female	152	67.56
Age	45 and below	112	49.78
	Above 45	113	50.22
Family Size	1-4 members	100	44.44
	5 or more members	125	55.56
Civil Status	Single	4	1.78
	Married	199	88.44
	Widow	19	8.44
	Living-in	3	1.33

Table 1 shows the distribution of the 225 respondents of the study. The female respondents are 67.56 percent and the 32. 44 percent male. Respondents who are 45 years old and below are 49.78 percent and the remaining 50.22 percent falls on the respondents over 45 years old. There are 44.44 percent of the family size of the respondents of 1-4 members and the 55.56 percent are having family members of 5 or more. As to the civil status of the respondents, the data shows 1. 78 percent are single, 88.44 percent married and 8.44 widows and the remaining 3 percent living-in civil status.

4.2. On the Practices on the Collection of Rainwater

Table 2. Practices on the Collection of Rainwater of the Respondents

Practices	Frequency	Percentage	Rank
Water saved from the roof	212	94.22	1
Locally made used water tank	41	18.66	4
Water saved from the roof gutter	127	56.22	3
Water saved from the used container	194	86.22	2
Water accumulated from motor and paddle boat	19	8.44	7
Excess Water saved from neighbouring houses	22	9.78	6
Water shared from other houses	32	14.22	5
Excess water from the ground or plants	4	1.78	9
Water saved from trees during rainy days	11	4.89	8

Table 2 above shows the rainwater harvesting practice on *water saved from the roof* is manifested by gaining a 92.22 percent with rank number 1 over other practices. Rank number 2 is the *water saved from the locally made used container* where the 194 percent obtains a 86. 22 percent. *Water saved from the roof gutter* is practiced by the 127 respondents of 56.22 percent and is rank 3. The item on the *locally made tank* is 18.22 rank on rank number 4. Meanwhile the lowest is on *excess water from the ground or plants* has 1.78 percent, followed by the second lowest manifested by 11 respondents of 4.89 percent which is ranked 8 *water saved from trees during rainy days; water accumulated from motor and paddle boats* rank 7, and rank 6 and five *excess water saved from neighboring houses and water shared from other houses* respectively.

4.3 On the Utilization of Rainwater

Table 3. Utilization of the Harvested Rainwater of the Respondents of the Study

Utilization	Frequency	Percentage	Rank
Personal cleaning	142	63.11	6
Watering the plants	211	93.78	1
Bathing of animals	141	62.67	7
Cooking	68	30.22	8
Cleaning the house	151	67.11	4
Washing the clothes	202	89.78	2
Drinking	43	19.11	9
Cleaning of the fish for cooking	144	64.00	5
Flushing the toilet	201	89.33	3

Utilization of the Harvested Rainwater in this study is shown on the table above. Results shows that Rank 1 is from among the items is on *watering the plants* of 93. 78 percent; *washing the clothes* as manifested by the 202 respondents is rank 2 of 89.78 percent; the 89.33 percent for *flushing the toilet* is rank 3 noted with 201 respondents. On the other hand the lowest in the rank is for *drinking* which is 19.11 percent; second to the lowest is for *cooking* with 68 respondents of 30.22 percent; and the third from the lowest is for *bathing of animals* ranked 7 with 141 respondents resulting to 62.67 percent.

4.4 On the Practices on Rainwater Harvesting Considering Variables in the Study

Table 4. Rainwater Harvesting Practices of the Respondents considering Variables

Variables	Classification	P1	P2	P3	P4	P5	P6	P7	P8	P9
Sex	Male	68	30	49	57	7	5	7	2	9
	Female	144	11	17	135	11	17	25	2	6
Age	Less than 45	101	18	57	93	11	11	20	4	6
	45 and above	111	23	69	99	7	11	12	0	5
Family	1–4 members	89	16	55	96	10	8	12	3	2
Size	5 or more	123	25	71	96	8	14	20	1	9
Civil	Single	6	1	3	3	0	1	2	0	0
Status	Married	186	38	110	169	17	19	29	4	9

When all the variables are considered in the study, table 4 revealed that the male respondents have higher practice on item 1, followed by item 4 and the third highest is item 3. These *water saved from the roof***,** *water saved from the used container* and *water saved from the roof gutter* respectively; and the items from among the top three lowest are the *excess water from the ground or plants***,** *excess water saved from neighboring houses* and *water shared from other houses.* On the other hand, the female respondents obtained the first three highest the same with that of the male respondents and the lowest starts the same with male respondents, *water saved from trees during rainy days***,** *water saved from the roof gutter* and *water saved from motor and paddle boats.*

Table 5. Rainwater Utilization of the Respondents considering Variables

Variables	Classification	U1	U2	U3	U4	U5	U6	U7	U8	U9
Sex	Male	53	63	52	27	42	56	21	47	58
	Female	82	142	89	41	109	146	22	97	143
Age	Less than 45	59	100	65	28	76	97	10	45	64
	45 and above	76	105	76	40	75	105	33	99	137
Family	1-4 members	66	97	67	34	73	98	13	48	67
Size	5 or more	69	108	74	34	78	104	30	96	134
Civil	Single	2	3	3	0	3	4	0	1	3
Status	Married	118	181	119	54	130	177	31	122	177
Rainwater Utilization per item	Yes	138	207	141	68	151	202	43	144	201
	No	78	9	75	148	65	14	173	72	15

In the variable on age, the respondents of less than 45 years old obtained the first highest frequency on *water saved from the roof,* followed by *water saved from the used container* and *water saved from the roof gutter* which are of similar result with that of 45 years old and over. Meanwhile the lowest from among two categories of age in the study have the same lowest on the practices of rainwater harvesting and vary the second lowest which is *water saved from the used container* and water saved from motor and paddle boats. Those respondents whose family size are having 4 -5 members**,** *water saved from the used container* ranked one with the frequency of 96, next in rank manifested by the 89 respondents on *water saved from*

the roof and the third highest is *water saved from the roof gutter* On the other hand, those family with more than 5 members obtained the highest is *water saved from the roof, water saved from the used container*, followed by *water saved from the roof gutter* respectively. Noticeably, the data shows that very few from among the respondents who are single are practicing rainwater harvesting. The highest from among married respondents is the *water saved from the used container*, ranked two *water saved from the roof* and followed by *water excess water from the ground or plants* and *water saved from trees during rainy days*.

4.5 On the Utilization of Rainwater According to the Variables in the Study

Number 1 in rank of male respondents is on *watering the plants* and the female is on *flushing the toilet* and the both *are the same with their lowest in rank on drinking*. Respondents of 45 years old and older and whose family members are bigger obtained the highest frequency on utilization in *flushing the toilet* and those whose age is under 45 years old and smaller in family size signifies *watering the plants*. Moreover, *watering the plants* is in the highest percentage (80 percent) among married respondents, noticeably single respondents have negligible utilization in the study.

4.6 On the Significant Relationship of Rainwater Harvesting Practices and Utilization

Table 6 shows the significant relationship between practice and utilization where items of both areas are considered. The results shows significant relationship on items 1, 3, 4 and 7 which are *water saved from the roof* and personal *cleaning*; *water saved from the roof gutter* and *bathing the animals*; *water saved from the used container* and *cooking*; *water given from other houses and for drinking* respectively. On the other hand, other remaining items shows no significant relationship. The result implies that the practice of the respondents in rainwater harvesting has its purpose on the part of the respondents of the study. May be it is safe to say that respondents manifest a purposive rainwater harvesting as members of the community.

5. SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary of Findings

5.1.1. With 225 respondents of the study, 67.56 percent are females and 32. 44 percent are males. Almost half (49.78 percent) are 45 years old and the remaining 50.22 percent are over 45 years old. More than half of the respondents (55.56 percent) are having family members of 5 or more, and the remaining percent have 14 members. In terms of civil status, 78 percent are single, 88.44 percent are married and 8.44 widow and the remaining 3 percent are in living-in civil status.

5.1.2. The rainwater harvesting practices in saving water from the roof obtained the highest in rank, followed by water saved from the container and third is water saved from the roof gutter. The lowest is on water excess water from the ground or plants has 1.78 percent, the second form the lowest is water saved from trees during rainy days.

5.1.3. The highest in rank is on practices and utilization of *water saved from the roof* (30 percent) and 144 (64 percent) of the female of the same result highest ranking is from *water saved from trees during rainy days* and *water saved from the roof gutter* and *water saved from motor and paddle boats*.

5.1.4. There are at least 49 percent of less than 45 years old obtained the first highest frequency on *water saved from the roof* and of similar result with that of 45 years old and over. *Water saved from the used container* ranked first with the frequency of 96 having 4-5 members while those with more than 5 members obtained the highest in *water saved from the roof*. To all those who are married, the *water saved from the used container* is number 1 in their practice

5.1.5. As to utilization, mostly of the male respondents manifest on *watering the plants* and the female is on *flushing the toilet* and the both are the same with their lowest in rank on "drinking". The 45 years old and older and whose family members are larger obtained the highest frequency on utilization in *flushing the toilet* and those whose age is under 45 years old and smaller in family size signifies *watering the plants*. The latter obtained the highest percentage (80 percent) and single respondents have negligible utilization in the study.

5.1.6. It is evident that a significant relationship between practice and utilization where items of both areas are considered. The results shows a significant relationship on *water saved from the roof* and *personal cleaning*; *water saved from the roof gutter* and *bathing of animals*; *water saved from the used container* and for *cooking*; *water given from other houses and for drinking* respectively. On the other hand, the remaining items shows no significant relationship.

The results imply that the practice of the respondents in rainwater harvesting has its purpose on the part of the respondents of the study. May be it is safe to say that respondents manifest a purposive rainwater harvesting as members of the community.

Table 6. Significant relationship between practice and utilization.

P/U	U1	U2	U3	U4	U5	U6	U7	U8	U9
P1	x2 11.4 df 1 sig. 0 Not Sig.								
P2		x2 0.15 df 1 sig. 0 .7 Sig.							
P3			x2 9.4 df 1 sig. 0 Not Sig.						
P4				x2 4.17 df 1 sig. 0.04 Not Sig.					
P5					x2 2.33 df 1 sig. 0.13 Sig.				
P6						x2 2.78 df 1 sig. 0.1 Sig.			
P7							x2 3.99 df 1 sig. 0.05 Sig.		
P8								x2 2.29 df 1 sig. 0.13 Sig.	
P9									x2 3.35 df 1 sig. 0.07 Sig.

5.2 Conclusions

Based on the findings of the study, the following conclusions were drawn:

5.2.1. Female respondents are most likely the ones staying at home and think tank of household activities while the husbands are responsible in fishing as the main source of income and livelihood of the family.

5.2.2. *Water saved from the roof* is known to be the usual practice due to the fact that water is limited in the island. This can help augment the daily needs for water. However, it is also observed that the respondents are having other simple ways of harvesting rainwater.

5.2.3. Regardless whether the respondent is male or female, the highest practice to both groups is on *water saved from the roof*. This may mean that both respondents are concerned with preserving rainwater. Furthermore, of all the variables in the study, the same item manifested the highest in rank which is *water saved from the roof* followed by *water saved from the used container*. This means that respondents felt the need of water from other sources particularly rainwater.

5.2.4. Utilization results imply primarily that respondents in general utilized rainwater in *watering the plants* and *flushing the toilet*. This confirms an inclination of individual respondents as where to use the rainwater in the households.

5.2.5. The respondents' behavior on the practice of rainwater harvesting sets impressions that this is purposely done for a special purpose of utilization.

5.3 Recommendations

With the findings of the study, the following are the recommended:

5.3.1. Households should be trained for clean and safe rainwater harvesting practice.

5.3.2. An orientation on preservation and utilization of rainwater may be conducted in the barangay.

5.3.3. Designing an individual households' rainwater infrastructure may be considered.

5.3.4. A Barangay water source infrastructure may be designed for an additional source of water for the community.

5.3.5. A proposal for Rainwater Utility Infrastructure in the Island Malangabang Concepcion Iloilo should be implemented.

5.3.6. A funding agency may be tapped to sponsor for the implementation of water source infrastructure in the barangay.

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