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### RESEARCH ARTICLE

#### KNOWLEDGE, AWARENESS AND ROLE OF WOMEN ON WATERSHED RESOURCE CONSERVATION AND PROTECTION IN ONE MUNICIPALITY IN THE PROVINCE OF ALBAY

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#### Abstract

This study was conducted to determine the knowledge, awareness of the women along bio- physical, economic, political and social characteristics of watershed in relation to water resource management. Also, this will examine the role of women on household and in community and the activities undertaken relative to the conservation and protection of watershed area in one municipality in the province of Albay, Philippines. The study utilized descriptive research design and data was analyzed using frequency counts, percentage and weighted mean. Data revealed that respondents are much aware of the biophysical, social, political and economic characteristics of watershed, as well on watershed conservation and protection practices. In contribution to water resource conservation women always practiced recycling of water. Women contributed to the conservation and protection because they have the important roles to be undertaken and but most of them were seldom practiced. Social responsibility on both household and community level is required for women as far as watershed is concern.

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#### Introduction:-

Water is very important as a medium for life and survivability. But then, many of the people were not able to manage it properly. They never know the importance of it as well as its conservation. The continuing problems for our waters are nonpoint source pollution and habitat degradation. These are the problems that are responsible for most of the water quality use impairments throughout. These are typically complex problems that are difficult to manage.

Both nonpoint pollution and habitat degradation generally cross-program purviews. To avoid these remaining problems, humans must know what possible solution to better understand the interactions between the environmental components and the actions that can be taken by all towards the goal of ecosystem integrity. However, many of our watersheds today are in varying states of degradation characterized by soil erosion, erratic stream flow, diminishing groundwater resources, loss of biodiversity, microclimate deterioration, and declining land productivity.

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It is important to protect and conserve the quality of water in our watershed because it is a basic human need. We need a healthy watershed to sustain life, in more ways than one. The protection of the natural resources in our watershed is essential to maintain the health and well-being of all living things, both now and in the future.

Women play an important role in the provision, management, and safeguarding of water resources. A woman under the household level plays the role in the management of the watershed. The realization of this role is seemingly hidden due to their multi-tasking activities inside their respective households. Despite this role, the women sector must be aware of their role in the conservation of watersheds. Their role can be helpful so that the next generation will be educated in proper utilization of water both in-home and community.

Water resource management is a wide-ranging field of discipline which includes protection, conservation, preservation, and utilization. This context will emphasize the role of women in the conservation and protection of water resources. Moreover, the identified role of women base on the analysis will be the basis in coming up with community interventions that will help in enhancing their capacities in the conservation of water resources in one municipality in the Province of Albay, Philippines.

### **Methodology:-**

The study was conducted in one municipality of the Province of Albay specifically Barangay Malabnig, Guinobatan, Albay wherein classified as watershed area which serve as source of water for consumption. The study utilized descriptive research design in determining the knowledge and awareness of women in water resource management specifically in conservation and protection of water resources. The study was conducted from August, 2020-December, 2020 by conducting interview to the target respondents following the protocol set by the Inter-Agency Task Force for the Management of Emerging Infectious Diseases (IATF). The respondent was comprising women with age ranging from 24 to 70 years old. Frequency counts, percentage and weighted mean were used to analyze the data.

### **Results and Discussions:-**

Table 1 shows the result of assessment of the knowledge and awareness of the respondents in the terminology 'watershed' and its concept. Data shows that 59 out of 98 respondents responded that they don't know what is watershed while 38 has the knowledge of it and the other one has no response. With these responses, it is shown that those who responded knowledgeable of watershed response that watershed is a catchment area of water from different outlets and the large number of respondents has no response.

On the other hand, in terms of the sources of information on their knowledge and awareness to watershed, respondents responds that their understanding was based on their self-actualization, some are coming from television, interviews with concern people, friend, radio and seminars. However, the large number of the respondent does not response on this parameter. Moreover, the knowledge and awareness on the coverage of the watershed was known by the respondents having the large number of about 66 respondents. Accordingly, the coverage of the watershed in their barangay was the water sources for the utilization of the households in the community.

In the parameter of the best way to learn more about the watershed, it is shown that most of the respondents want to learn more and educate them regarding watershed management is by means of training and seminars. In terms of water quality and quantity, all the respondents responded that there is a constant change in the quality of water. Many of the water sources were not safe for drinking water because based on the records at Municipal Rural Health Unit there are cases of amoeba. The quantity of water in the river and other sources are presently decreasing due to the loss of vegetative along the water sources. Historically, the community is rich on water sources wherein people in this area are not encountering water insufficiency. This constant change is now alarming the community that in the near future they will lost their sources.

Further, in terms of utilization of the watershed, the multiple responses arise. Based from this data, the streams and rivers were used for laundry, washing kitchen utensils and swimming as well. The respondents were also asking regarding the benefits they get from watershed, respondents said that it is their source of water for both drinking and washing or other purposes. Also, it is also the sources of food because of the existence of remaining vegetation along these areas and other benefits which help them in augmenting the needs of the family especially the basic

needs. It is also assessed that aside from the respondents' benefits, the barangay or the community in totality benefited the watershed contribution.

Furthermore, based on the interviews and community scanning, the major sources of water in the locality were the spring, followed by deep well and tanks operated by electricity and the like. In terms of the sufficiency of water, respondents states that the water in their community is enough for their needs. However, there are times that supply of water is decreasing. Data in this table implies that the women in the locality were knowledgeable and aware of what watershed is and its benefits to personal and community.

**Table 1:-** Knowledge and awareness of women on watershed and watershed management.

Indicators	Frequency (n = 98)	Percent
1. Do you know what is watershed?		
Yes	38	38.8
No	59	60.2
No response	1	1.0
2. What is a watershed?		
Catchment area	32	32.7
Habitat	9	9.2
River, stream, lake, wetland	2	2.0
No response	55	56.1
3. How did you learn about watershed?		
Self	26	26.5
Television	6	6.1
Interview	6	6.1
Friend	3	3.1
Radio	1	1
Seminar	1	1
No response	55	56.1
4. Do you know that your area is covered by watershed?		
Yes	66	67.3
No	32	32.7
5. What do you think is the best way to learn more about watershed?		
Seminar	88.0	89.8
Workshop	5.0	5.1
Focus group discussion	4.0	4.1
Symposium	1.0	1.0
6. Do you think that the water quality and quantities of rivers in your area is changing?		
Yes	98	100.0
If yes, what was the change?		
Decrease	98	100.0
7. Do you still use the streams in your area for any of the following?		
Laundering	98	100.0
Washing kitchen utensils	95	96.9
Swimming	90	91.8
8. What are the benefits you get from the watershed?		
Water	97	99.0
Land	97	99.0
Food	93	94.9
Medicinal plants	93	94.9
Wildfire	79	80.6
Charcoal	76	77.6
Commercial lumber	5	5.1
Biodiversity	2	2.0

Electricity	1	1.0
9. Except for yourself, who do you think benefits more from the watershed?		
Barangay	61	62.2
Next generation	19	19.4
Entire municipality	10	10.2
Purok	4	4.1
Entire province	2	2.0
Family	2	2.0
10. What is the source of your water?		
Spring	78	79.6
Deep well	17	17.3
Tank	15	15.3
11. Do you think that the water supply is enough for your daily consumption?		
Enough	93	94.9
Not enough	5	5.1

Table 2 shows that different problems and issues in watershed along its biophysical aspect. Based on its ranking, it is clearly shown that with the weighted mean gathered and its interpretation, women respondents are much aware. However, with the continuous human activities and interventions these problems and issues were rapidly experienced. Accordingly, a respondents' statement supports these problems because all this are environmental concerns which we as human do not pay attention because all we need is to earn money from it. It is further elaborated that human intervention is one of the major problems why these problems are experienced.

**Table 2:-** Level of awareness of women on problems and issues on watershed along biophysical aspect.

No.	Problems and Issues	Weighted Mean	Interpretation
1.	Severe soil erosion	2.92	Much Aware
2.	Droughts	2.89	Much Aware
3.	Rainfall	2.88	Much Aware
4.	Forest destruction	2.88	Much Aware
5.	Floods	2.85	Much Aware
6.	Water pollution	2.84	Much Aware
7.	Deforestation	2.81	Much Aware
8.	Air pollution	2.79	Much Aware
9.	Erratic stream flow	2.78	Much Aware
10.	Overgrazing	2.72	Much Aware
11.	Diminishing water resources water shortage	2.70	Much Aware
12.	Loss of biodiversity	2.64	Much Aware
13.	Micro climate deterioration	2.63	Much Aware
14.	Declining soil/ land productivity	2.61	Much Aware
15.	Deterioration of water quality and quantity	2.57	Much Aware
16.	Oxygen generation	2.53	Much Aware
17.	Carbon sequestration	2.41	Much Aware

Table 3 shows that level of awareness of the women on problems and issues on watershed pertaining to social aspect. This means that social aspect is more on the activities of the number of populaces along water consumption, conservation and protection of the water sources. Data shows that they much aware in over using of water in the community. Accordingly, it is revealed that the women are much aware in the improper waste disposal however awareness is not enough to say that they are knowledgeable in doing proper waste disposal. Women were also aware in improving the use of water utilization especially inside the household. Based on the respondents claim, they are aware of utilizing and re-utilizing the water in their kitchen and in the comfort room. On the other hand, it is common problem in the community that over use of water, burning of waste materials and other problems were rated as aware. However, they do not tend to solve or to do necessary solutions to avoid causes of problems from these identified problems. Data on Table 3 implies that social responsibility is lacking in the people in the community though they are aware of the existing problem and issues along watershed areas. Along these problems

listed on Table 3, it is further analyzed that the social responsibility is the key problem and solution to make everything in control.

**Table 3:-** Level of awareness of women on problems and issues on watershed along social aspect.

Rank	Problems and Issues	Weighted Mean	Verbal Interpretation
1.	Improper waste disposal	2.93	Much Aware
2.	Improve water use	2.93	Much Aware
3.	Pervasive poverty	2.89	Much Aware
4.	Over use of water	2.83	Much Aware
5.	Burning of bio and non-biodegradable waste	2.77	Much Aware
6.	Available and adequate good quality of water for drinking	2.66	Much Aware

Sustainability of watershed conservation and protection is achieved when the law was properly implemented. Hence, political intervention is required as one of the elements of conserving and protecting the watershed areas for its sustainability.

Data revealed that the women were much aware in the provision of necessary sanction to those who violates the policies pertaining to watershed conservation and protection. It is also revealed that the women were much aware in the activities of the barangay officials in monitoring the environment. On the other hand, awareness of the youth in terms of the laws governing the utilization, conservation, protection and preservation and other laws, it shows that they are moderately aware. It is also stated that they are much aware of the law because the government is informing them the policies, rules and regulations. Accordingly, they know that doing against the law is punishable and ignorance excuses no one. This was the basis where in the women is looking for some answer to the questions regarding laws in relation to environmental protection. The data implies that political organization plays an important role in the dissemination of relevant laws governing environmental protection specifically in watershed areas. This will help people to participate in conservation and protection of the water sources in the community.

**Table 4:-** Level of awareness of women on laws, rules and regulations pertaining to watershed.

Particulars	Weighted Mean	Interpretation
Pres. Decree No. 856, Sanitation Code of Phil.	2.90	Much Aware
R.A no. 8041, National Waste Crisis Act (1995)	2.78	Much Aware
R.A 9275, Clean Water Act (2004)	2.64	Much Aware
Monitoring of the environment by the barangay official	2.61	Much Aware
Giving sanctions to violators and non-violators	2.52	Much Aware

Table 5 shows the awareness of the women on the problems and issues on watershed along economic aspect. Based from the presented data, the availability of natural resources for livelihood activities is the identified as major problem and issues in watershed having the weighted mean of 2.85 and interpreted as much aware. Accordingly, women and households as well are much aware of the said problem. However, with the limited resources they are not conscious of the effect of unwise utilizing of watershed resources. Another problem that has been identified and falls on is the availability and affordability of the construction materials for building water tanks to supply water in the community. This was supported by the barangay captain that they want to sustain, conserve and protect the sources of water in the barangay that is why they want to build tanks. However, with the insufficient fund of the LGU they do not attain this goal in the present.

On the other hand, the availability and adequate good quality of drinking water is also a problem in the community. With the existence of the hundred years old natural well (bukal) people in the community rely in this for drinking water. For the long years that have been passed, it cannot sustain the needs of the community because of the environmental effect of human activities that contributes to its degradation. Many cases have been recorded in the Municipal Rural Health Unit that some of the residents got illness from drinking water from the well. Moreover, the unavailability, unaffordability and inadequacy of food were also a problem along the watershed areas. Also, the decrease in income was identified as problem in the community wherein most of the respondents' family sources of income is farming. With the geographical location of the community, it is hard for the farmers to produce a large-scale agricultural production. In this case, resources along the watershed areas were used for economic purposes. As

discussed on Table 2, forest destruction and other activities were undertaken by the people to augment the needs of the family. With the geographical characteristics of the community, people tend to increase agricultural production to support the needs of the family. It is shown that the said activity was identified as problem along watershed area. Accordingly, the intensive use of chemical pesticides has been considered as contributor to water quality degradation. The common practice of the farmers is that they mixed the chemical on their knapsack sprayer near the source. On the concept of crop production management, the application of chemical components to eliminate pest and disease were done to meet the highest yield, however with the stated activity the part per million of the chemicals used were goes to the water sources and will be acquired by the people. This data on Table 5 implies that people are aware of this economic problem in relation to watershed conservation and protection; however, they have nothing to do but to continue their practices to augment the needs of the family without considering the long-term effect of the said activities.

**Table 5:-** Level of awareness of women on problems and issues on watershed along economic aspect.

Problems and Issues	Weighted Mean	Interpretation
Unavailability natural resources for livelihood activities	2.85	Much Aware
Decrease in income	2.78	Much Aware
Unavailability and unaffordability of construction materials	2.77	Much Aware
Unavailability, unaffordability and inadequacy of food sources along watershed area	2.61	Much Aware
Unavailability and adequate good quality of water for drinking	2.53	Much Aware
Decrease in the production of crops and animals	2.23	Aware

Table 6 shows the rate of household roles of women in the conservation of water. It is revealed that reusing the water for plant watering in the morning was on the rank 1. Based from the respondents' responses, after washing the dishes, taking a bath, etc. they practice recycling the water instead of throwing it. The weighted mean of 3.44 was interpreted as *always* was responses wherein those who have electric water pump uses less electricity. Hence, they tend to use deep well in collecting water.

Practices of using less water was undertaken seldom by the women respondents. Another, turning off the tap while washing / scrubbing the hands was practiced seldom. Also, taking shorter shower was seldom practiced by the women. Moreover, an activity which was interpreted as never were activities which part of their role as household keeper, however, women tend to let it over flow due to many obligations inside their house. This means that women play an important role in conserving water since those alternative ways were undertaken. It is also implies that the social responsibility is associated to women's role as far as the watershed is concern.

**Table 6:-** Rate of undertaking of household roles by women in the conservation of water.

No.	Household roles	Weighted Mean	Interpretation
1.	Reuse of water for plants in the early morning	3.47	Always
2.	Use less electricity	3.44	Always
3.	Use your dishwasher and clothes washer for watering	3.33	Always
4.	Don't use the toilet as an ashtray or wastebasket	3.28	Always
5.	Flush with less	3.10	Seldom
6.	Turn off the tap while washing/ scrubbing your hands	2.97	Seldom
7.	Take shorter showers.	2.93	Seldom
8.	Keep an eye on your bill to spot leaks	1.09	Never
9.	Don't run the dishwasher or washing machine until they're full	1.02	Never

Data on Table 7 implies that community roles were never practiced / exercised by the women due to the overlapping activities inside their households. However, in terms of tree planting activities they are seldom but actively participating. This is because of the mandate of 4P's Program that every household should plant a tree to conserve and protect the environment.

**Table 7:-** Frequency of undertaking of community roles by women in the conservation of water.

No.	Community roles	Weighted Mean	Interpretation
1.	Tree planting	2.52	Seldom
2.	Develop and implement sustainable water management programs to meet the present and future water needs of residents and businesses	1.00	Never
3.	Promoting water-efficient practices	1.00	Never
4.	Educating residents and businesses about water efficiency	1.00	Never
5.	Get involved with non-profits that concentrate on water conservation (e.g.,	1.00	Never

Table 8 shows the rate of undertaking of women in the protection of the watershed areas in the community. Based from the ranking, women are actively participating in planting beneficial grasses in the waterways to contain the water and filter the waste that will contribute to the lowering of quality of water. On the other hand, the items under rank 6 to 8 were seldom practiced by the women because it is their husband's activities. However, planting trees as reflected on the community roles, women seldom joined to tree planting activities because of the mandate of the government program.

**Table 8:-** Frequency of undertaking as practiced by women in protection of watershed area.

Rank	Protection practices	Weighted Mean	Interpretation
1.	Grassed waterways	3.95	Always
2.	Wet land enhancement	3.95	Always
3.	Residue management	3.91	Always
4.	Reduce impermeable pavement	3.89	Always
5.	Reduce, Reuse and Recycle plastics	3.65	Always
6.	Proper disposal of Chemicals	3.07	Seldom
7.	Using organic fertilizers and Pesticides	2.96	Seldom
8.	Planting trees	2.69	Seldom

Table 9 shows the rate of undertaking on watershed conservation practices done by the women respondents. Data implies that with the awareness of the concept of watershed and it uses in human lives, listed practices were done always or seldom. However, with the abundant water supply in the community other conservation practices were done.

**Table 9:-** Rate of undertaking as practiced by women in watershed conservation.

Rank	Conservation practices	Weighted Mean	Interpretation
1.	Not throwing of garbage in rivers, streams and canal	3.97	Always
2.	Minimize used kitchen sink garbage disposal units	3.83	Always
3.	Take shorter showers	3.47	Always
4.	Collect water from the rain	3.16	Seldom
5.	Close the faucet after you used it.	2.05	Seldom
6.	Checking the faucet if closed properly	2.01	Seldom
7.	Check faucets and pipes for leaks	1.95	Seldom

### Conclusion:-

Majority of the women did not know about watershed, but they were much aware on environmental characteristics along biophysical, social, political and economic aspect, most of them were much aware with the problems and issues because they were able to observed and experience the effects of deteriorating watershed. Also, most of them recommend to held seminars and trainings relative to watershed conservation and protection. Women contributed to the conservation and protection because they have the important roles to be undertaken and but most of them were seldom practiced. Furthermore, social responsibility on both household and community level is required for women as far as watershed is concern.

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