

## Conservation Practices of Maguindanaons in Lake Buluan, Maguindanao, BARMM

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### ABSTRACT

This study was conducted to determine the conservation practices of the Maguindanaoan community in Lake Buluan, Maguindanao, BARMM. A descriptive qualitative method was employed and a total of 50 respondents were randomly selected and interviewed using a structured questionnaire. *Pearson* correlation was used to assess the strength of the relationship of the variable considered. Data showed that most of the respondents are male (64%) and all are Maguindanaoan. The overall mean knowledge of biodiversity and conservation among respondents was very high, ranging from 4.21-5.00. However, the perceived attitude of the respondents towards biodiversity and conservation was medium, indicating that the majority of the respondents are aware of the loss, exploitation, and reasons of the loss of habitat of native species in the area. The overall mean of 4.16 indicates a high sense of dependent on biodiversity at Lake Buluan. It further showed a high sense of responsibility in preserving the environment, cultural homogeneity, and a high level of community belongingness in Lake Buluan. There is a significant correlation between community awareness and age, knowledge, practices, and well-being. Furthermore, the results of this study can be used as the basis for the government and policymakers in developing a more effective strategy for promoting biodiversity conservation.

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## **INTRODUCTION**

The earth is currently experiencing a grave catastrophe related to biodiversity loss that has never occurred in human history. This resulted in food security, livelihoods, economic equality, and human health all being at risk because of this catastrophe. It is important to note that the biological diversity of Earth serves as the basis for human existence and welfare. Biodiversity and the natural ecosystem not only regulate the weather but also provide us with sustenance, food, and even medical remedies, all of which help to keep humanity safe from the ravages of nature (Protecting Biodiversity, 2022a). The participation of humans or locals in maintaining and nurturing our remaining natural resources is very important. It is humans that are putting our natural environment at risk due to unregulated harvest and extraction of resources; thus, we can also find solutions in addressing the disturbances we introduced.

The human dependency on our environment especially on the provisioning service that the ecosystem offered us mostly resulted in overexploitation. Sustainable extraction and utilization of the resources are not being observed by the locals. Moreover, these activities don't affect only the needs of humans but even our climatic conditions. Promoting sustainable utilization, conservation, and protection of our remaining natural resources is significantly crucial to sustaining these resources for future generations. Various kinds of literature showed that cultural communities depend directly on natural ecosystems such as lakes for their sustenance (Possey et al., 1999; Geronimo et al., 2016). Accordingly, biodiversity and natural ecosystems have a relationship with the economic identity and cultural and spiritual values of the people.

The Maguindanaoan are inland-dwelling Muslims who cultivate rice as their basic food crop and survive on fishing and weaving mats and baskets. They are known as people of the flood plains or derived from the two words "mangiged" and "danaw" meaning people of the marshy. This group of Muslim people is very rich in their beliefs, culture, and practices. One of those is the "apo na palay". This is a ritual and chants incantation over the rice fields at night to ensure a good harvest. They also believed that peace can be anchored on the sustainable utilization of resources, conservation of biodiversity, and preservation of indigenous Maguindanao culture (FPE, 2023). Thus, the study was conducted to assess the knowledge, attitude, and practice on the conservation of Maguindanaoans thriving in Lake Buluan, Maguindanao, BARMM.

## **LITERATURE REVIEW**

### **What is Biodiversity Conservation?**

"Management, restoration, and protection of biodiversity to achieve long-term benefits for current and future generations." Other definitions include "the entirety of genes, animals, and ecosystems in a specific area." The protection, management, and maintenance of ecosystems and natural habitats to maintain their health and functionality are referred to as biodiversity conservation (Vedantu, 2022).

### **How can protecting biodiversity benefit people?**

According to research (FAO, 2019) by the Organization for Economic Co-operation and Development, ecological advantages like agricultural pollination, water purification, flood protection, and carbon sequestration are all ways that biodiversity benefits people. In addition, the existence of innumerable, diverse species on our planet in their natural habitats contributes to the survival and well-being of people.

Almost one million plant and animal species are currently in danger of going extinct, according to a 2019 UN assessment. The report also claims that humans have "seriously affected" around 75% of the terrestrial ecosystem and 66% of the marine environment; land degradation has decreased production on 23% of the world's land area. Also, due to the loss of coastal habitat, between 100 and 300 million people are at an increased risk of hurricanes and floods.

### **To safeguard biodiversity**

The basis for human existence and welfare is the biological diversity of life on Earth. Biodiversity and healthy ecosystems, which regulate the temperature and give people access to food, fertile soil, and healthcare, help to lessen the impact of natural disasters (Ferguson et al., 2010; Clough et al., 2011; Chu & Karr, 2017).

But, biodiversity is dwindling, and many of the world's most important biodiversity hotspots are found in nations that are struggling with poverty, food insecurity, and speeding up climate change (Kotir, 2010; Johnston et al., 2014; Myers et al., 2017).

The primary causes of biodiversity loss are human behavior and activity that are not sustainable. We must support and promote more responsible and sustainable methods of conserving soil, water, forests, and wildlife if we are to protect biodiversity—and the prosperity of people everywhere (Porter et al., 2010; Brown, 2012).

### **Awareness of Biodiversity Conservation**

The Oxford Dictionaries define awareness as concern and informed interest in a condition or development, as well as knowledge, perception, and sensitivity to environmental concerns (Hanson, 2018). Those who are aware of biodiversity conservation understand how human actions affect biodiversity. Hence, the term "awareness of biodiversity conservation" (Akindele et al., 2021) refers to the public's concern with the issue of biodiversity and the necessary actions to preserve it.

KAP (Knowledge, Attitude, and Practice) is a particularly useful tool for studies of conservation and management since it aims to gauge public perceptions of biodiversity as well as current public behavior and willingness to take action in support of these findings used in numerous studies in other developing nations.

To achieve food security and environmental preservation, sustainability is essential. The KAP model examines knowledge, attitudes, and practices related to sustainable agriculture (Muleme et al., 2017; Lee et al., 2021; Liao et

al., 2022). Jackson (2022) defined knowledge in this context as familiarity with, awareness of, or comprehension of a community as well as facts, information, descriptions, or abilities about the topic of interest that are acquired through experience or education through perception, discovery, or learning. Lack of acquaintance with one's surroundings may be a symptom that one doesn't appreciate the importance of safeguarding species of plants and animals since it has an impact on their welfare (United Nations Environment Programme, n.d.). A constant way of thinking or feeling about anything is called an attitude, and it has to do with any widely held social perceptions of that object. Also, a lack of information results in a decrease in public support for biodiversity conservation and sustainable use, insufficient engagement in conservation activities, and ultimately, a lack of motivation to address the numerous parts of the biodiversity dilemma

Moreover, including indigenous and local knowledge and increasing public participation, particularly among women, in decision-making processes in protected areas are crucial to the success of conservation programs (Abukari & Mwalyosi, 2020)

However, protecting biodiversity (Di Marco et al., 2019) has a number of challenges. Conflicts with different social actors, which are frequently reflected in animosity toward conservation management officials, human population growth, which is reflected in the increased harvest of natural resources, development growth, which is reflected in the growth of extractive industries, which increases demand for natural resources, climate change, which is reflected in biodiversity loss (Jantz et al., 2015) and changes in ecosystem services, and emerging wildlife diseases, among other things, are all factors (Bellard et al., 2012; Muluneh, 2021; Dunne, 2022).

## **METHODOLOGY**

The descriptive qualitative method was utilized for the study. This technique is believed to benefit researchers in identifying the Lake Buluan locals and their level of biodiversity and conservation awareness, including their knowledge, attitude, habits, and well-being.

The residents of the Barangay Poblacion of the Municipality of Mangudadatu are the study's respondents. A total of fifty (50) randomly chosen respondents completed the survey created by the researcher. One (1) respondent per home was randomly chosen among those who resided in Lake Buluan.

The questionnaire items were printed and disseminated in a face-to-face manner. It was translated from an English researcher-made instrument to a Maguindanaoan dialect to better understand each item statement by the respondents.

The instruments consisted of 5 parts. The demographic profile, knowledge, practices, and well-being. In the demographic profile, basic profiles like sex, age group, marital status, level of education, and ethnicity were taken from the respondents. The measurement for knowledge consisted of ten (10) item statements with a basic five (5) Likert Scale: Very Confident = 5, Fairly

Confident (4), Neither Confident nor Unconfident (3), Fairly Unconfident (2), and Very Unconfident (1). A ten (10) items statement with five (5) Likert Scale of Strongly Agree = 5, Agree = 4, Neither Agree nor Disagree = 3, Strongly Disagree = 2, and Disagree = 1. On the practices of the local community, there were ten (10) item statements with a Likert Scale of Always = 5, Frequently = 4, Often = 3, Sometimes = 2, and Never = 1. A total of ten (10) item statements related to well-being with a Likert Scales of Extremely Satisfied = 5, Very Satisfied = 4, Neutral = 3, Slightly Satisfied = 2, and Not all Satisfied = 1. The research instrument was pilot-tested at cronbach alpha of 0.77 **indicates an acceptable level of reliability** (Ioana et al., 2015) in a non-respondents group to insure the validity and reliability of the item questionnaire.

The researchers utilize the random-sampling technique in which each sample has an equal probability of being chosen. The researchers' random sampling method, maximizes the probability that any particular sample will be selected from the community living in Lake Buluan. It should be accurately represented by a random sample because that is the purpose of the sample.

## RESULTS

The table presents the demographic profile of the local community involved in this study. There is a total of 50 respondents, whereby 64% (n=32) of them were male, while the remaining 36% (n=18) were female. 100% of the respondents belonged to the Maguindanoan. Most of them are from primary education and belong to the minimum wage income in the community. Most of the respondents belong to the age group of 18-30 and were married. The demographic profile of the local area covered by this study is shown in the table. There were 50 responders in all, with 32 (or 64%) of them being men and 18 (36%; 50) being women. The Maguindanoan ethnic group was represented by all respondents. The majority of them only have primary education and earn the local minimum wage. The majority of respondents were married and in the age range of 18 to 30 (Table 1).

*Table 1 The Demographic Profile of the Community (n =50)*

Items	Categories	Frequency, n	Percentage, %
Sex	Male	32	64
	Female	18	36
Age-Group	<18	9	18
	18-30	13	26
	31-40	10	20
	41-50	10	20
	51-60	5	10
	<60	3	6
Marital Status	Single	14	28

	Married	28	56
	Widowed	8	16
Level of Education	Primary School	23	46
	Junior High	14	28
	Senior High	6	12
	College	6	12
	Post Graduate	1	2
Monthly Income	< 10 000	17	34
	10, 957 - 21, 914	33	34
Ethnicity	Maguindanaon	50	100

The overall mean (mean=4.13) in Table 2 demonstrates that respondents' awareness of biodiversity and conservation was extremely high. The means of all ten items are extremely high and range from 4.21 to 5.00. It shows that they strongly concur with each point relating to the fundamental ideas of genetics, conservation, and biodiversity as they are observed at Lake Buluan. In addition, despite the respondents' basic school education, questions 6 and 9 demonstrate good knowledge of biodiversity protection, while the remaining items demonstrate extremely high knowledge. This demonstrated the significance of public awareness in promoting the protection of biodiversity in Lake Buluan, with the theory being that the greater one's familiarity with biodiversity, the greater one's willingness to support its preservation.

*Table 2 The level of knowledge towards biodiversity conservation (n =50)*

Item	Std. Deviation	Mean	Mean Interpretation
1	.81	4.50	Very High
2	.76	4.44	Very High
3	.75	4.62	Very High
4	.67	4.44	Very High
5	.61	4.56	Very High
6	.88	4.16	High
7	.53	4.62	Very High
8	.52	4.64	Very High
9	1.08	3.96	High
10	.70	4.42	Very High
<b>Total</b>		<b>4.43</b>	<b>Very High</b>

According to the table below, respondents' attitudes toward biodiversity and conservation were moderate, with a mean overall score of 3.14 ranging from 2.16 to 3.21. The respondents are well-versed in biodiversity and conservation concepts. This means that their attitudes toward Lake Buluan indicate that the vast majority of respondents are acutely aware of the exploitation, habitat loss, and prelude to habitat loss of local native species (Table 3).

*Table 3 The attitude towards biodiversity conservation (n =50)*

Items	Std. Deviation	Mean	Interpretation
1	.99	2.48	Low
2	.95	3.50	High
3	.89	2.68	Medium
4	1.04	2.40	Low
5	.73	2.16	Low
6	.63	4.04	High
7	1.45	3.24	High
8	1.32	3.38	High
9	1.35	3.20	Medium
10	.71	4.34	High
<b>Total</b>		3.14	Medium

Table 4 shows the practices of the locals towards biodiversity conservation and data reveal that most respondents (78%, n=39) place a high value on using different techniques and efforts to conserve biodiversity in Buluan Lake, adhering to biodiversity and conservation laws, utilizing indigenous peoples' traditional knowledge to preserve the environment and biodiversity, making the most of limited resources to maintain the diversity of species, and religiously adhering to environmental policies.

The outcome demonstrates that a high level of biodiversity and conservation efforts are implied by the overall mean of 4.16. The public's current practices have a better possibility of changing in the future with a good engagement to policies and a good involvement of stakeholders towards conceptualizing biodiversity protection.

*Table 4 The practices towards biodiversity conservation (n =50)*

Items	Std. Deviation	Mean	Mean Interpretation
1	.49	4.28	Very High
2	.55	4.34	Very High
3	.72	4.00	High
4	.66	4.04	High
5	.51	4.06	High

6	.68	3.94	High
7	.45	4.20	High
8	.41	4.22	Very High
9	.79	4.06	High
10	.50	4.50	Very High
<b>Total</b>		4.16	High

The total mean of 4.16 in the table shows that Lake Buluan places a lot of importance on biodiversity. Those who profess to care for the air, water, and land as well as their culture and community are in the community, according to the highest mean. They should abide by the guidelines, according to a strong feeling of duty for environmental preservation (Table 5).

Table 5 The well-being of Maguindanaons towards biodiversity conservation (n =50)

Items	Std. Deviation	Mean	Mean Interpretation
1	.49	4.28	Very high
2	.55	4.34	Very high
3	.72	4.00	High
4	.66	4.04	High
5	.51	4.06	High
6	.68	3.94	High
7	.45	4.20	High
8	.41	4.22	Very High
9	.79	4.06	High
10	.50	4.50	Very High
<b>Total</b>		4.16	High

The strength of the connection and the degree to which variables were related to one another were assessed using Pearson correlation. A score of 0 suggests that there is no connection, whereas a value of 1 demonstrates a flawless linear relationship. A significant connection was discovered by the current analysis. Community awareness towards biodiversity conservation of Lake Buluan are strongly related. Age and community comprehension of biodiversity conservation are strongly correlated.

Table 6 Relationship between knowledge, attitude, practices, and well-being towards biodiversity conservation (n =50)

Knowledge, Attitude, Practices, and Well-being	Sex	Age	Marital	Ethnicity	Education	Income
	1	0.55	0.38		0.05	0.47
Sex		0.257	0.45		0.91	0.34
		4	4	4	4	4

	1	0.09		0.83	0.17
Age		0.85		0.03	0.73
		4	4	4	4
		1		0.02	0.55
Marital				0.95	0.25
			4	4	4
			1		
Ethnicity				4	4
				1	0.14
Education					0.78
					4
					1
Income					

The table displays an  $R^2 = .72$ , indicating a strong association. As an efficient model, the knowledge model was statistically significant. The results indicate that the respondents have significant knowledge of biodiversity conservation (Table 7). As stated by Sefi Mekonen (2017) indigenous knowledge was acknowledged as complementary to and equal to scientific knowledge in the field of ecology, and its relevance on a global scale has grown.

*Table 7 The regression coefficient for predicting the community knowledge of biodiversity conservation.*

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.84 <sup>a</sup>	.72	.37	.17

a. Predictors: (Constant), Income, Education, Sex, Age, Marital

The  $R^2$  value in the table is .28, which indicates a moderately poor correlation. Thus, the community needs to develop its attitude toward biodiversity conservation (Table 8). These results may enhance a more positive attitude toward biodiversity conservation. There is evidence in many countries of a relative shift in values and norms favoring biodiversity conservation. The challenge is to accelerate these trends and to do the scale (Cowling, R.M).

*Table 8 The regression coefficient for predicting the community attitude of biodiversity conservation.*

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.53 <sup>a</sup>	.28	-.61	.90

a. Predictors: (Constant), Income, Education, sex, age, Marital

The table shows a strong relationship between community awareness and  $R^2 = .63$ . It means that the local community in Lake Buluan is effectively impacted by the community's biodiversity and conservation behaviors. The claim is supported by (Chisnall, 2001) stating that people are part of a communal society, they are influenced by its norms as they develop and participate in its social, cultural, and economic components through their livelihoods. Therefore, novel behavioral change, awareness can spread within a community where people are connected.

Table 9 The regression coefficient for predicting the community practices of biodiversity conservation.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
	.794 <sup>a</sup>	.631	.169	.15905

a. Predictors: (Constant), Income, Education, sex, age, Marital

The table shows a clear connection.  $R^2 = .63$  indicates a significant correlation. It reveals how the level of well-being in the community has a positive influence on biodiversity and conservation consciousness (Table 10).

Table 10 The regression coefficient for predicting the community well-being of biodiversity conservation.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
	.798 <sup>a</sup>	.637	.184	.15813

a. Predictors: (Constant), Income, Education, sex, age, Marital

## DISCUSSION

As the community is made up of people of the same ethnicity, the results showed a high level of community belonging to Maguindanaoan, demonstrating a good relationship between the environment and community leaders. Cultural homogeneity suggests a prosperous and secure neighborhood, natural resources meet my needs, income and living expenses are in the region, and I never feel threatened by the Lake Buluan ecosystem's life and richness.

Serious problems on sustainability degradation on economics develop a range of benefit on the investigation towards biodiversity and conservation.

The overall sample size for the demographic profile of the local population was fifty people, with men accounting for 64 percent of the total (n=32) and women accounting for 36 percent (n=18). The individuals who responded were all from Maguindanao. The vast majority of them are recent graduates of elementary school and make the least amount of money in the area. The majority of respondents are either in their twenties or their thirties, and they are married.

Hence, despite the correlation analysis of the attitude as a parameter for testing the model, it must be improved. Thus, knowledge, practices, and well-

being had a significant relationship in contributing to the model for community awareness in Lake Buluan. Therefore, it contributes as an aid to government and policy-makers in developing a more effective strategy for promoting biodiversity and conservation as an effective parameter to the demographic profile of the respondents and the community. A study (Salvaña & Arnibal, 2019), findings suggest involving the knowledge of local community leaders will help develop conservation priorities.

The overall mean score of 4.13 suggested that the respondent's understanding of biodiversity and conservation was quite high. This was revealed by the score. The values of all ten items are very high, ranging from 4.21 to 5.00 respectively. It is evident that they are in complete agreement with all of the claims that pertain to the fundamental concepts of genetics, conservation, and biodiversity as they are understood at Lake Buluan. In addition, in spite of the fact that the respondents have just completed elementary school, their knowledge of the importance of preserving biodiversity is excellent in items 6 and 9, and it is really high in the remaining items. According to the findings of the research, raising public awareness is essential for promoting the protection of biodiversity at Lake Buluan. This is due to the fact that having an understanding of biodiversity is linked to having attitudes toward the preservation of biodiversity.

The respondents' assessed attitudes toward biodiversity and conservation were deemed to be moderate after receiving a mean score of 3.14 and a range of 2.16 to 3.21 points on the Likert scale. The respondents have a good understanding of biodiversity and the importance of conservation. The comments of the vast majority of respondents on Lake Buluan imply that they are aware of the exploitation and destruction of habitat that has been inflicted upon the native species of the area.

The demand for economic growth, which is impacted by some environmental restrictions related to biodiversity issues, is less significant in the promotion of the welfare of the living community and the leadership's perceived values toward the goal of biodiversity conservation, which is itself a threat to the continued economic prosperity of our nation. So, addressing the concerns and issues that people have with biodiversity does not have an effect on people's attitudes toward conservation in the long run.

The loss of biodiversity has a big impact on respondents' perceptions of their settings, thus it is best left to experts who are willing to give up their possessions or money to deal with biodiversity concerns and all human activities.

It demonstrates that respondents thought people are less worried about biodiversity and conservation issues even if they are more aware of the effects of anthropogenic activities. Despite the fact that it is only based on the opinions of the respondents, their concern for the public is a fantastic sign of both their caring for the public and their concern for conservation issues while growth is still going place to maintain the cost of living in the community.

They are really concerned about the horrible possibility that a number of native plant and animal species could become extinct.

The overall mean was 4.16, which demonstrates the significance of Lake Buluan's diverse plant and animal life. The highest mean suggests that respondents place importance on their own culture and community, and that they are concerned about the quality of the air, water, and land around them. They should comply with the requirements since they have a great sense of responsibility for the preservation of the environment.

The findings showed that there is a high level of community belongingness, which demonstrates a favorable interaction between the environment and community leaders. This is due to the fact that the entire community is made up of people of the same ethnic group. A high degree of cultural homogeneity denotes a high level of safety in the neighborhood; nature's resources meet my needs; I have a job and a place to live; and Lake Buluan's life and biodiversity never put me in danger.

The Pearson  $r$  correlation was used to determine the degree to which the variables were related to one another as well as the strength of the relationship that existed between them. A value of 0 indicates that there is no link, whereas a score of 1 illustrates a perfect linear relationship between the two variables. The recent investigation uncovered a link that has great significance. The awareness of the community and Lake Buluan are inextricably linked to one another. Age and community comprehension of biodiversity conservation are strongly correlated.

As a consequence of this, the model has to be modified despite the fact that it was assessed by using attitude as a parameter in the evaluation. Consequently, knowledge, habits, and well-being have an impact on the Lake Buluan community awareness model. As Naeem et al (2016), stated societies strive to move towards more sustainable development paths, it is important to understand the relationship between biodiversity and human well-being correctly.

The results confirmed by the study stated that Local community awareness, involvement, and collaboration with management organizations and other development partners are crucial for biodiversity conservation (Wang & Jia, 2012; Whittington & Pagiola, 2012). Hence, the result it is helpful in establishing a more effective plan by the government and policymakers for promoting biodiversity and conservation as a useful criterion for the demographics of the respondents and the community. This is because the demographics of the respondents and the community are taken into consideration.

## **CONCLUSIONS AND RECOMMENDATIONS**

This study's strength is determining the most advantageous branding group to evaluate government interventions, barriers, and expectations. By identifying the most advantageous group and the barriers, more targeted policies and scientific approaches can be used to address community challenges.

Because the model was evaluated using attitude, it must be updated. Hence, knowledge, habits, and health affect the Lake Buluan community

awareness model. As a result, it helps the government and policymakers create a better biodiversity and conservation plan by using the demographics of respondents and the community. This is possible since it helps create a better plan. Because neighborhood demographics and respondent demographics are considered. Further research on species evaluation and intervention programs is recommended by the study in order to improve the model's attitude component for local community awareness.

### **FURTHER STUDY**

The study recommends a further study on the species richness and profiling on the biodiversity of the location.

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