



## Conservation beliefs and practices of indigenous people in Northwestern Cagayan, Philippines: implications for environmental promotion and education

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### Abstract

This study investigated how the indigenous people of North-western, Cagayan, Philippines conserve and utilize natural resources in their communities. The study employed ethnographic qualitative and descriptive survey research designs to the twenty-four informants purposively selected in the three Agay-communities. The research techniques used were a structured interview, participant observation and focus group discussion to support the process of data gathering. Findings revealed that majority of the informants are male, with the age bracket of 21 to 30 years old, and did not attend formal schooling. Their economic survival activities are dependent on natural resources in their communities. Further, it was revealed that the indigenous people have their own framework of conservation beliefs and practices along forest and wildlife resources, water resources, plants and trees, and on their land farming practices which are reflective of their indigenous knowledge and belief system. Furthermore, the indigenous people worldview considers the conservation and protection of natural resources such as plants, animals, forest and water which are part of Mother Earth where human beings are the stewards and trustee of the land and other natural resources and they have the responsibility for its preservation. Their process of utilizing and conserving these natural resources is a manifestation that they have an eco-friendly indigenous belief system. Hence, recognizing and understanding their role in environmental conservation and protection can be a converging point for environmental adaptation and promotion and at the same time incorporation in education curriculum to foster acceptance and consciousness of the younger generations on indigenous ecological knowledge.

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## Introduction

Biodiversity has the fundamental value of human survival. However, at present, it is being assaulted due to rapid and accelerating anthropogenic activities causing the persistent decline in species diversity. Conservation of biodiversity has become one of the dilemmas facing in both developed and the developing world (Lawton & May 1995). Hence, ways and means to preserve the biodiversity of the earth are considered an imperative endeavor in the present century.

Harnessing the local knowledge of cultural groups through people-oriented approach can contribute to the promotion of environmental conservation. According to Getahu (2016), Indigenous Peoples have strong social and cultural values, ordered social control and cohesive systems rooted in their Indigenous knowledge of the universe in general and their locals in particular. They have normative and well thought-out behavior in their relations with an adaptation to their wider ecological niche hitherto established in their worldview.

The Philippines is a rich tapestry of ethnic diversity. The Philippines is a home to more than 110 indigenous cultural communities inhabiting seven major ethnolinguistics regions. The Agtas are indigenous people who live in scattered, isolated mountainous parts of Northwestern part of Luzon, Philippines. They are considered to be Negritos who have dark brown-skinned, small body build up, with curly hair. They are believed to be among one the earliest inhabitants of the Philippines preceding the Austronesian migrations.

The role of the indigenous people in environmental conservation is impeccable. Synthesis from research literature suggests that they can contribute to developing sustainable environment, particularly in natural resources management. In the study of Piras (2011), it was revealed that when Indigenous People are empowered to build upon their cultural and spiritual values of forests, deforestation is minimized, conservation efforts are successful and the community receives greater benefits from managing

natural resources. Likewise, Cobbinath (2011) also mentions that the recognition of the role of cultural practices is imperative to overcoming environmental degradation. Further asserted by Fongod *et al.* (2014) findings that traditions, customs, beliefs and cultural rights play an important role in environmental conservation and biodiversity.

The local beliefs and systems of the indigenous people of Northwestern Luzon, the Philippines on environmental sustainability can be regarded as indigenous science which is effective and has practical value. Borrás (2000) claimed that traditional knowledge should be valued, given these same respect and considered as useful and as necessary as other forms of knowledge. Hence, there is a growing recognition the traditional knowledge, technologies and cultural expressions are not just old, obsolete and maladaptive. They can be highly evolutionary, adaptive, creative and even novel.

This study explored the different conservation beliefs and practices of the indigenous people in the Northern-western Part of Luzon, Philippines. It specifically describes the understanding and beliefs of their conservation practices along wildlife resources, land use, water resources, and plant and trees resources. The present study hopes to present a model for environmental conservation.

## Materials and methods

### Method

This study employed a mixed of ethnographic qualitative and descriptive quantitative approaches as it uncovered the environmental conservation practices of the Agays of Lasam, Cagayan, Philippines. According to Frankel and Wallen (2006), the emphasis in ethnographic research is on the documentation or portrayal of the everyday lived experiences of individuals which can be gathered by way of observation and interview. Likewise, the descriptive quantitative approach focused on the descriptive survey of informants' personal characteristics. Calmorin (2007) describes the usefulness of such survey to provide the value of facts and focusing attention on the most important things to be reported.

Meanwhile, the standard participant observer method was employed and unstructured interview technique was utilized to gather the data for the study. These are necessary for as much as the study is qualitative.

The interview was used as the primary tool in gathering the data and camera was utilized to capture the events needed in the study. Since this study is qualitative in nature, employing participation observer technique was used as the researchers sought information from the informants.

Further, field notes were also used, by listening to the narratives of the informants.

Upon writing the facts gathered from the informants, the researchers compared their statements with what they have in the field notes.

*Participants*

The participants of the study were the eighteen Indigenous people chosen through site selection approach guided by these set criteria: 1) the respondents must be at least a full-blooded IP; 2) must be married with children. Participation of the informants was voluntary. They responded based on the nature of their experiences and willingness to participate. Further, as ethical considerations of the study, the informants were informed that the interviews conducted were recorded. Autonomy, confidentiality anonymity, and reciprocity were observed by the researcher.

*Site of Study*

The study site was in the Municipality of Lasam, Province of Cagayan. This study covered the three IP communities in the municipality namely specifically located in Barangays Peru, Sicalao, and Cabatacan West.



**Fig. 1.** The map of the province of Cagayan showing the Municipality of Lasam situated in North Western Cagayan where the IP communities are located.

The Municipality of Lasam is an agricultural community situated in the north-western portion of Cagayan province. It is circumscribed on the northwest by the Municipality of Allacapan, Cagayan and Flora, Apayao; on the east by the Cagayan River and Gattaran, Cagayan; on the northeast by the municipality of Lal-lo; on the south by Sto. Nino, Cagayan; and on the southwest by the municipality of Rizal, Cagayan.

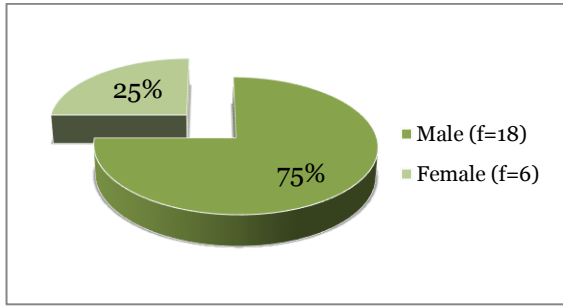
The municipality of Lasam has an aggregate land area of approximately 23,400 or 234 square kilometers. This is evenly distributed among its 30 barangays.

**Results and discussion**

*Personal Characteristics of the Informants*

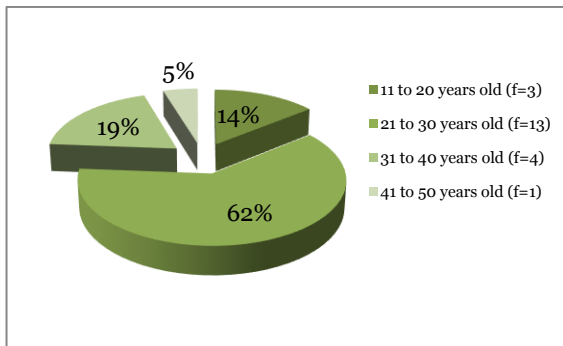
The profile of the informants reveals that majority are male (75 percent), belonged to the age bracket of 21 to 30 years old (62 percent), have no formal education (71 percent).

Their economic survival activities are depended on the natural resources of their communities.



**Fig. 2.** Frequency and Percentage Distribution of the Informants as to Gender.

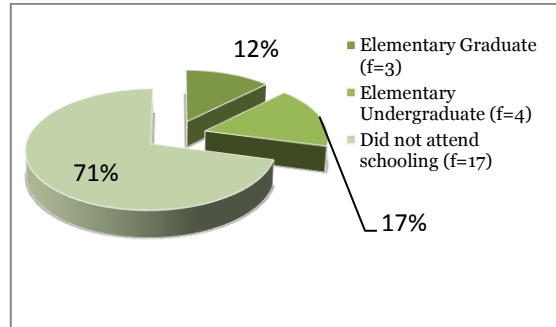
The personal characteristics of the informants as to their gender (Fig. 1) indicate that majority (75 percent) are males and only six (25 percent) are females. This indicates that most of the male indigenous people are engaged in environmental conservation beliefs and practices compared to the females. This can be attributed that males are the ones usually do wildlife and fish hunting, foraging, and doing farming while the females were left at home responsible of taking care their children.



**Fig. 3.** Frequency and Percentage Distribution of the Informants as to age.

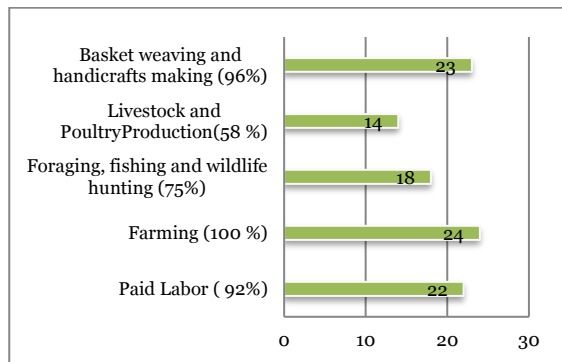
Majority of the number of cases had an age bracket of twenty-one to thirty years old (62 percent). This finding generally means that most of the informants are relatively young. Further, their marriage at a young age is contributory to the increasing number of their population. There were only four (19 percent) of them belonged to the age bracket of thirty-one to forty years old followed by the fourteen percent of those who have eleven to twenty years old. The least number of informants are those who belonged in the age brackets of forty-one to fifty.

This would mean that the indigenous people of the Municipality of Lasam, Cagayan have a short lifespan.



**Fig. 4.** Frequency and Percentage Distribution of the Informants as to the level of education.

Out of twenty-four informants, seventeen (71 percent) did not attend formal schooling. Only four (17 percent) are elementary undergraduate and the least were three informants (12 percent) are the elementary graduate. This finding means that most of the respondents only attained an elementary level. During their younger years, they need to take care of their siblings and they need to work for their daily living thus their attendance to formal schooling is very low.



**Fig. 5.** Frequency and Percentage Distribution of the Informants' Economic Activities and Livelihood.

As to the economic survival activities of the informants, most of them are engaged in farming (100%), basket weaving and handicrafts making (96 percent), paid labor (92%), livestock and poultry production (58%), foraging, fishing, and wildlife hunting (75 percent). The finding implies that the indigenous people have their own livelihood activities, mechanisms and coping strategies to survive with great dependence on natural resources.

*Environmental Conservation practices of the Indigenous People*

The present study generally investigated how the indigenous people of north-western Cagayan conserve their natural resources. This encapsulates their local knowledge beliefs and systems on how they promote environmental sustainability in their communities.

The succeeding tables reveal the conservation beliefs and practices of the informants along forest and wildlife resources, water resources, plants and trees, and on their farming practices based on the themes of their responses.

**Table 1.** The conservation practices on Forests and wildlife resources.

Indigenous Forests and Wildlife Conservation practices	Frequency of Responses (n=24)	Percentage
1. selective hunting of wildlife particularly the female and pregnant animals	21	88
2. trapped and injured young animals were brought home to be taken care of	17	71
3. Observe designated months for hunting	22	92
4. prevent burning which can drive destroy habitat for wildlife	15	63

As gleaned from the data, it revealed that twenty-one (88%) of the informants responded that they employ selective hunting of wildlife, particularly female and pregnant animals. According to them, the animals they usually hunt are *sunggu* (Philippine macaque), *abuyog* (wild chicken), *billit* (birds), *alingu* (wild pig), *banyas* (monitor lizards), and *uleg* (reticulated python). These animals were also being sold in the nearby markets or being exchange to goods with the Ilocano-lowlanders. The informants also noted that they consider some of these as their ethnomedicinal animals which they believe can cure their ailments such as *gurigur* (fever), *uyek* (a cough) and *sakit ti tyan* (stomachache). For them, conserving and protecting these animals would make them secure the sustainability of their foods and medicines.

Meanwhile, seventeen (71 percent) of the informants also said that that they practice bringing home and taking care injured and young animals being caught in

their indigenous trapping tools and later on release when the animals recovered.

In like manner, twenty-two informants (92 percent) affirmed that they follow designated months for hunting to give time for the animals to reproduce and regenerate. They wait five to eight months before going back to the woodlands for another hunting activity. Consequently, fifteen (63%) informants declared that they prevent burning which can destroy or drive away the habitat of animals.

In this way, they believe that they can protect wildlife resources of their communities. The data imply that the indigenous people have their own beliefs and ways of conserving wildlife resources. These practices can be important bases for developing a conservation framework which is sustainable. According to Tanalgo & Baleva (2015), wildlife hunting and trade are considered as serious threats to biodiversity worldwide and these activities contribute largely to the decline of many wildlife species. Hence, local and indigenous communities play an important role in conserving the remaining natural resources. Communicating and understanding the ways of indigenous people and engaging them to be the key players of conservation is considered an initial step in attaining a participatory local conservation initiative since they can be the primary stewards of biological wealth.

**Table 2.** The conservation practices on water resources.

Indigenous Aquatic Resources Conservation practices	Frequency of Responses (n=24)	Percentage
1. selective fishing particularly female and pregnant	17	71
2. natural techniques of fishing	24	100
3. catch fish only for consumption	21	88
4. follow designated months for fishing	16	67
5. keeping rivers free from floating dung and waste products	24	100

When asked about their beliefs and practices on the conservation of water resources, Table 2 presents the five coded responses.

In the data, it reveals that there were seventeen (71 percent) of informants observe selective fishing especially the female ones and those on the stage of reproduction.

The informants believed that by way of releasing these resources, they may continue the cycle of reproduction of their species. Among what they usually hunt are *igat* (eel), *udang* (freshwater shrimp), *bukto* (mullet), *gurami* (gourami), *dalag* (mudfish), *carpa* (carp), and *kappi* (fresh water crabs).

All the informants (24 or 100 percent) believed that using natural techniques of fishing is a good conservation practice than employing destructive techniques of fish hunting. They narrated that among the traditional fishing techniques they employ are *panagkammel* (hand-gathering), *panagpana* (spearfishing), *pag-banniit* (angling) and *panagsilo* (trapping). Such fishing techniques are natural ways which can help them segregate the fish without killing them. In like manner, sixteen (67 percent) responded that when fishing they consider the months of their maturation and spawning period of the natural resources. Likewise, all the respondents agreed that keeping the rivers near their communities clean and free from floating dung and waste is another water conservation practice they do.

They believed that when the rivers become filthy that might cause them ailments because it is their main source of drinking water. Hence, it is their responsibility to maintain the cleanliness of the rivers.

It can be inferred from the responses of the informants that they practice their own conservation practices on water resources. Ashoori, Bagheri, Allahyari, & Rimawi (2015) stress that conservation of water resources is one of the most important features of sustainable development. Healthy intact watersheds provide many ecosystem services that are important for the social and economic well-being of people (US-EAP, 2012).

**Table 3.** The conservation practices on Plants and trees.

Indigenous Plant and Trees Conservation practices	Frequency of Responses (n=24)	Percentage
1. use dropped twigs as firewood	23	96
2. selective cutting of trees	22	92
3. Planting of trees	20	83
4. giving time for orchids and other forages to grow before harvesting it	18	75
5. planting herbal medicines	24	100

Another finding revealed is the conservation practices of the indigenous people on plant and trees. Table 3 presents five indigenous practices. Twenty three (96 percent) of the informants responded that they use dropped twigs as firewood for cooking their foods. The informants also noted that they also used cut driftwoods they can get from the rivers. They also utilize them as construction materials for their shanties.

In the same way, twenty-two informants (92%) practice a selective way of cut trees where they only cut the mature once. When asked about it, they claimed that trees on all-aged condition must be replaced. By way of planting, trees may serve as sanctuaries for faunal species to grow and live. Consequently, twenty informants (92 percent) said that whenever they cut down trees they practice tree planting. The indigenous people stressed the importance of plants and trees for their foods and survival. They recognized the importance of these resources to hold water by preventing floods and destructive effects of typhoons.

Further, all the informants noted that they plant herbal medicines in their communities. Among the ethnomedicinal plants they used are *bulong ti saba* (banana leaves) to cure fever, *makabuhay* (*tinospora rumphii*), *sikal* (talahib) for constipation, *bain-bain* (makahiya) for a cough and wounds. It can be interpreted that the indigenous people still depend on plants and trees as treatments for ailments. The indigenous people have their distinct beliefs and practices of conserving plants and trees. Plants are vital parts of worlds' biological diversity; they have many uses for the survival of the indigenous people.

Hasan, Othman & Ahmad (2016) noted that plants and trees are natural assets that need to be preserved. Suria *et al.* (2013) also affirmed that trees improve the lifestyle by moderating local climate, reducing stormwater runoff, improving air quality, protecting wildlife and attractive to birds.

**Table 4.** The conservation practices on Farm Lands.

Indigenous Farm Land Conservation practices	Frequency of Responses (n=24)	Percentage
1. use of organic fertilizers	24	100
2. showing kindness to rats and pests that might destroy their plants when mistreated	11	46
3. manual weeding of farms	18	75
4. Employing their Indigenous Local Knowledge to protect their crops and farms	23	96

It is also important to note that the indigenous people have their conservation beliefs and practices to conserve their farmlands. Table 4 shows the responses of the informants. All the respondents use organic fertilizers for their farms and vegetable gardens. They stressed that using peels from fruits, rice stalks, and corn stalks when decomposed can maintain the nutrition of the soil making it suitable for their horticultural activities. Similarly, eighteen (75 percent) of the informants disclose that the practice manual weeding to clear the area and they burn stalks and leaves to prepare their gardens and farms for the succeeding planting season. They also used decomposed kakawate leaves (*Gliricidia sepium Leguminose*) as soil ameliorant.

Twenty-three or 96 percent of the informants related that they use inverted (*palatang ti niyog*) coconut fronds strategically placed in their fields resembling an animal can scare rodents and birds. They also used banana logs (*lambaan ti aba*), rice stalks (*garami*), as (*linung*) mulch for their newly planted vegetables. It is also interesting to note that eleven (46 percent) of the informants have the belief that rodents should be treated with kindness because they can destroy their plants when they show the action of mistreatment.

They also offer rituals and peace offering to rodents while they talk to them begging not to destroy their crops. In this way, they believed that they can drive away the pests in the farms.

Among the farming and agricultural products they produce are rice (*pagay*), banana (*saba*), mais (corn), cassava (*kahoy*), sweet potato (*kamotit*), jute (*saluyut*), squash (*karabasa*), monggo (*balatong*), beans (*sitaw*), ampalaya (*parya*), wild chili pepper (*sili*), eggplant (*tarong*) and papaya. This produce was also the foods they eat if not sold. They also stored these products for their future consumption. The indigenous people have their own beliefs and practices on conserving and protecting their lands with the use of environmental-friendly techniques.

The finding of this study confirms Grolink (2005) that any community possesses indigenous knowledge whether rural and urban, settled or nomadic, original inhabitants and migrants. This indigenous knowledge belongs to the specific community or local group and the people in a given community have developed over time, and still continue to develop.

Furthermore, the indigenous people have the worldview that natural resources such as plants, animals, forest, and water are part of *Ina Daga* (Mother Earth) and they must harmoniously co-exist with them by way of using, protecting and conserving them. For them, their land is sacred, the land is their life. It is where they live; it is also the place where they will be buried. Hence, nature is a friend to the human being and it needs respect and proper care.

Another interesting belief they adhere is the presence of unseen beings and deities protecting the *karayan* (rivers), *bakir* (forestlands), *taltalon* (fields), and other water bodies are considered sacred sites and should be free from human exploitation, interferences, and disturbances. If not guarded, the unseen beings might cause them ailments. The finding shows that the indigenous people they can trace their beginnings on the land which their culture is rooted and on where they live.

*Implications of the Conservation Beliefs and Practices of the Indigenous People to Promotion and Education*

The conservation beliefs and practices of the indigenous people present a framework of eco-friendly initiatives which are parts of their worldview in their relations to natural resources. As educational implication of the study, the finding presents insights their conservation techniques and practices can be used an important input in teaching environmental education or as reference of teaching social science, science education, and indigenous science to be integrated to topic of interest of sustainability, plants, animals, water resources, use of herbal medicines, eco-friendly indigenous farming practices, and culture. This study will present and open up dialogue to foster acceptance and consciousness of the younger generations about indigenous ecological knowledge to become vanguards of the environment.

Furthermore, the findings of the study also offer implications to different agencies and stakeholders advocating environmental protection to promote eco-friendly indigenous practices on farming, wildlife and water resources management to counter the negative effects of technologies that can severely damage the environment. Observing Indigenous Knowledge and Systems or the natural approach of resource management can help mitigate climate change as well as minimize or even avert the loss of biodiversity and habitat degradation.

### **Conclusion**

Based on the findings of the study, it is concluded that the indigenous people of North-western Cagayan, Philippines

Have their own framework of conservation beliefs and practices along forest and wildlife resources, water resources, plants and trees, and on land farming practices which are reflective of their indigenous knowledge and belief system. They also share a worldview that conserving and protecting natural resources such as plants, animals, forest, and water are part of Mother Earth where human beings are the stewards and trustee of the land and they have the responsibility to preserve it.

Furthermore, these resources serve as their chest box of their comprehensive ecological knowledge, and at the same time the repository of their cultural traditions and identity. Their process of utilizing and natural resources is a manifestation that they have an eco-friendly indigenous belief system. Hence, recognizing and understanding their role in environmental conservation and protection can be a converging point for environmental adaptation and promotion and at the same time incorporation in education curriculum to foster acceptance and consciousness of the younger generations on the different ecological knowledge. This study recommends that there is a need to recognize the indigenous knowledge of the communities to protect culture and biodiversity, the government should give the due recognition particularly on giving them their ancestral territories. Likewise, there is also a need to strengthen local regulations which encourage sustainable use of resources by way of adopting the natural farming method of the indigenous people. Also, strong linkages and participation of the different agencies and the academe to support the indigenous peoples by way of making initiatives of enhancing and strengthening their ecological belief system to ensure sustainability. Furthermore, university scholars need to work on this agenda for sustainable biodiversity conservation and development.

As for directions for future researchers, there is still a need to study the relationship between the livelihoods, governance and their overall resources conservation practices of the indigenous people in Northwestern, Cagayan, Philippines. Likewise, conservation studies on the plants and animal species currently being heavily exploited by the indigenous people should be conducted.

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