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Lifescape and Mindscape of Cateel Upland Rice Farmers and their Indigenous Post-Harvest Practices

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Abstract

This descriptive study explored the lifescape, mindscape, and indigenous post-harvest practices of upland rice farmers in Cateel, Davao Oriental. The research aimed to determine the respondents' socio-demographic, socio-economic, and psychosocial characteristics, as well as their production practices, land conservation methods, and post-harvest technologies. A total of 32 respondents participated in the study. Data were gathered through semi-structured interviews and Participatory Rural Appraisal (PRA) tools, including livelihood analysis, seasonal calendars, and flow diagrams. The respondents were primarily male, married, and engaged in farming as their main occupation. Upland rice cultivation served as their principal source of livelihood, supplemented by coconut farming, abaca production, coffee cultivation, and small-scale entrepreneurial activities. Most respondents owned the land they cultivated, although they generally earned low monthly incomes and had educational attainment limited to the elementary level. The study further revealed that indigenous post-harvest practices remain an important aspect of their farming system. Traditional storage facilities such as Kamarine, Limot, and Tambuang were commonly utilized, while natural materials including tanglad, katutis, sangig, and alingatong leaves, were used as seed preservatives. Farmers predominantly relied on organic fertilizers, selected seeds through traditional methods such as "yabyaban" or "taphan," and used seeds saved from previous harvests. Although some traditional rituals have evolved due to cultural and religious influences, indigenous knowledge continues to guide farming practices. Women played a vital role in seed selection, preservation, and storage. Overall, respondents recognized land as their primary means of livelihood, survival, and cultural continuity.

Keywords: Alingatong, Kamarine, Limot, Mandaya, Yabyaban

Introduction

Indigenous post-harvest practices play a significant role in establishing both durables and perishable crop production. Indigenous knowledge contains a mechanism of creativity and innovativeness suitable for the upland farming system. Indigenous post-harvest practice is also a local culture wherein environmental conditions, cultural norms, social roles, and physical conditions are strictly observed (Warren, 1987).

Derived from many years of experience, these practices have been handed down through oral traditions. Until now, despite the introduction of new technologies, indigenous practices have been found to be an effective tool in harvesting. It is also time-tested and has paved the way for sustainable agriculture. Thus, indigenous post-harvest practices are a solid understanding that influences food safety, quality, and losses through wastage. These further help to secure a reliable supply of food. Moreover, as influenced by the lowland community, the local people cope with the change in the socio-cultural and environmental conditions. Indigenous post-harvest practices were applied by farmers for good farming in the upland community.

As cited by Warren (1987), indigenous practices can go a long way in assuring product safety and quality while minimizing wastage and increasing food business productivity. Also, post-harvest practices are a cost-effective tool for farming systems, essentially in rice production, and a means to sustainable effort for survival. This local knowledge provides local people with a strategy for poverty alleviation and income generation. Post-harvest pertains to the manual operation that gives lower loss levels of grains compared to machine-processed ones. However, any delay in the post-harvest process should be avoided to prevent spoilage of grains.

This study focused on the indigenous post-harvest practices of upland farmers and their corresponding lifescape and mindscape practices. Specifically, it sought to determine the socio-demographic and socio-economic characteristics of the respondents; identify and describe the indigenous post-harvest practices of upland farmers; examine the lifescape processes in terms of land use, cost-efficiency of post-harvest practices, and the role of farming as a livelihood for sustainable local development; and explore the mindscape of the respondents by determining their perceptions regarding the use and importance of the landscape as well as their attitudes toward change. The study also investigated the Mandaya people's cultural norms, social roles, and physical conditions that affect upland rice farming, and identified indigenous environmental land conservation practices. Furthermore, the study aimed to determine the socio-demographic and socio-economic characteristics of the respondents, describe the indigenous post-harvest practices of indigenous people in the upland community, assess the effects of these practices on the environment, examine the lifescape and mindscape practices of upland farmers, understand their perceptions of landscape use and conservation, identify the cultural norms, social roles, and physical conditions influencing upland rice farming, and determine the indigenous environmental land conservation and resource management practices employed by the community.

During the republic crisis before, indigenous practices played an important role. The study, moreover, gave a remarkable point of understanding the way indigenous people perceived, developed, and sustained their own economic farming systems. This would give them some input on the importance of their work and give them enough courage to continue and develop indigenous practices. This provided an avenue for researchers about indigenous post-harvest practices and those who would conduct further studies about the indigenous people. This also served as a database to the concerned agencies for future study. The data could help in developing a new technology on post-harvest practices and this could serve as a basis in the formulation of additional policies for the welfare of indigenous people.

The study focused mainly on the description of the upland rice farmers. Indigenous post-harvest practices, their lifescape, under which were the land use, production, livelihood and their mindscape However mindscape dealt with the perception of IP's on the use and need of land The study covered only four (4) upland barangays where some of the upland rice farming is situated namely; Aliwagwag, Aragon, Maglahus and Malibago. Its results were

based on the data collected during personal interviews using a semi-structured questionnaire for upland rice farmers. Actual observation was used as a supplement to the information drawn from the survey instrument.

METHODOLOGY OF THE STUDY

Description of the study

This study was conducted in four barangays situated in Cateel, Davao Oriental. The barangays covered were Palma Gil, Alvar, Sobrecarey, and Pichon, specifically in sitio Sangab. These are all upland communities that employ an upland farming system (Figure 1).

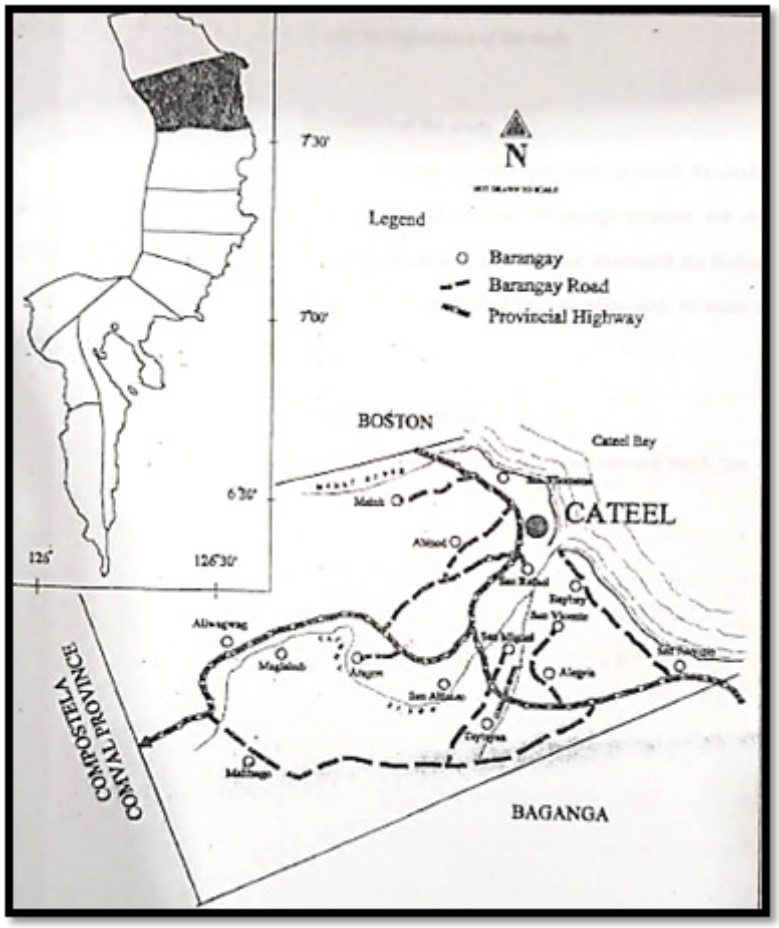

Figure 1. Map of the study area.

This study used a participatory action research method, employing participatory resource appraisal tools like semi-structured interviews, seasonal calendar, livelihood analysis, flow diagram, and community management. The respondents were the leaders (datus) representing the various Mandaya communities in Davao Oriental and the elders of the Mandaya communities in Davao Oriental. The various communities, their datus, and the elders were identified through coordination among the office of the cultural minorities and various NGOs working with the Mandaya people and the Mandaya farmers themselves.

Data collection

Purposive sampling was used in the study. Based on the objectives of the study, the respondents were identified and selected to provide information regarding the problem at

18 hands. To establish rapport with the respondents, a pre-interview was scheduled in order to explain to the respondents the purpose and the importance of the study. The study observed the following procedures: a) community entry protocol, b) checked and validated research tools, c) coordinated with various linkages (government and non-government, d) conducted participatory action research, e) analyzed and interpreted the findings, f) validated the findings with the community, g) performed the Write shop, and h) made the publication.

RESULTS AND DISCUSSION

LIFESCAPE

Socio-demographic profile of Cateel upland rice farmers

The respondents of the four (4) upland barangays of Cateel (Aliwagwag, Aragon, Maglahus, and Malibago) were mostly farmers (97%), aged 31-40 years old with an average age of 35 (34%), married (75%), with an average household size of 5 (47%). According to Sigmund Freud (1856-1939), everything both good and bad seems to stem from the expression or repression of the sex drive. On the other hand, Erik Erikson (1902-1994) believed that the ages between 20s and 50s are considered middle adult thus their significant relations are households and workmates, their psycho-social modalities are to make and to take care of their families. They possess a virtue of care and being afraid of over extension and reactivity. This shows that the farmers in Cateel, based on the theory, were in the stage of caring for their families, most especially when the household size is 5-6 or 47%.

Socio-Economic profile of upland rice farmers

Table 1 below showed that the rice farmers mostly (91%) depended on upland rice farming, while a considerable number of respondents (28%) were also dependent on coconut as their main source of income. Other sources of income came from corn (41%), abaca (28%), and coffee (19%). Others were also engaged in fishing (6%), carpentry (3%), and small business (3%).

Table 1. Socio-demographic characteristics of the four (4) Upland Barangays of Cateel, Davao Oriental.

Age	**Frequency (n)**	**Percentage (%)**
21-30	9	28.13
31-40	11	34.38
41-50	8	25.00
51-60	1	3.13
61-70	3	9.38
Total	**32**	**100.00**
Gender		
Male	31	96.88
Female	1	3.13
Total	**32**	**100.00**
Civil Status		
Married	24	75.00
Single	6	18.75

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Single	6	18.75
Widow/widower	2	6.25
Total	**32**	**100.00**
Household size		
1-2	0	0.00
3-4	9	28.13
5-6	15	46.88
7-8	5	15.63
9-10	3	9.38
Total	**32**	**100.00**

This showed that even their major sources of income cannot sustain their basic needs because they engaged in several occupations aside from farming. This agreed with the theory of Erik Erikson on psycho-social virtues such as taking great care for the welfare of their family.

A considerable number of the respondents (40.63%) had income ranging from P2,000 to P3,000. Based on their sources of income, this did not match their declared sources of income, the imposition of taxes was avoided. This proved an issue due to a lack of education in their community. The lack of proper dissemination of government services towards these upland rice farmers can be supported further by the livelihood analysis. This seemed to be an epidemic in the community since the government did not take definite action to cater to their needs.

Table 2. Socio-economic characteristics of upland rice farmers.

Sources	**Frequency (n)**	**Percentage (%)**
Upland rice	28	87.50
Corn	13	40.63
Coconut	16	50.00
Abaca	9	28.13
Kapi	6	18.75
Total	**32**	**100.00**
Main source		
Upland rice	29	90.63
Corn	0	0.00
Coconut	3	9.37
Abaca	-	-
Kapi	-	-
Total	**32**	**100.00**
Other sources		
Fishing	2	50.00
Carpentry	1	25.00
Store/small business	1	25.00
Total	**4**	**100.00**
Income level		
1000 below	7	21.88

1000 below	7	21.88
2,000 – 3,000	13	40.63
4,000 – 5,000	8	25.00
6,000 – 7,000	3	9.38
8,000 – 9,000	0	0.00
10,000 above	1	3.13
Total	**32**	**100.00**

Lifescape of upland rice farmers

Upland rice farmers believed that land resources are vital to their livelihood (100%). The post-harvest practices are still actively used in their own culture. "Taphan" and "yab-yaban" were among the ways of selecting the seeds for replanting and consumption (100%). Preserving the seeds by using natural herbs from the environment (100%) and utilized. Indigenous ways of storing the seeds, Tambuang, Kamarine, and Limor (91%), and only a few occasionally used sacks (9%). One problem with seed production was the high content or percentage of mixture found in a particular variety grown. The right cultural management in production had to be emphasized to eliminate the unwanted seeds. This was for stable high yields with good cooking and rating qualities, and freedom from major pests and diseases.

Farmers significantly believed that their seeds came from their own community or from within the members of the family (elders) (97%). Planting was done either in November or December (100%), and varieties being planted were perya (97%), libo-libu (9%), buisan (9%), kaubac (6%), pilit (9%), and sungi (6%). These rice varieties were planted in hilly areas (90.60%). These varieties had specific characteristics. According to BPI, IRRI, and UPLB, mostly in the Philippine setting, farmers were also seed growers who had gained competent skills in seed production. Farmers had patterns in rice farming mostly in the second quarter of the crop period (November December). Thus, November and December were the early months of the Northeast monsoon (Amihan), and rain fell evenly distributed in all parts of the country. These varieties being planted were harvested within three (3) months (Tres Meses). Thus, this answered the physiological needs of the farmers for good consumption.

Ethnic tribe, educational attainment, and organizational involvement

Almost all of the respondents (96.9%) in the study area were Mandaya, and half of them. (50%) were elementary graduates. Twenty-five percent reached the high school level. Only a few (12.50%) were part of an organization, since 87.50% were not affiliated with any organization. (But they recognize the existence of the barangay and tribal community). This significantly showed that the respondents only obtained basic education, where according to Maslow's Hierarchy of Needs, is within the first few levels. Thus, respondents were satisfied only with fulfilling their basic education.

Table 3. Lifescape of upland rice farmers.

Land as a Natural Resource	**Frequency (n)**	**Percentage (%)**
Planting Area/Source of Livelihood	32	100.00
Total	**32**	**100.00**
Post-harvest Process		
Seed Selection (during harvest, taphan, yab-yaban, good seeds are stored for replanting and consumption)	32	100.00
Total	**32**	**100.00**

Total	**32**	**100.00**
Seed Preservation		
Protected by Natural Means (herbicides sili, leaves of alingatong, tanglad, catotis, and sangig)	32	100.00
Total	**32**	**100.00**
Seed Storage		
Seeds were stored in kamarine, limot, or tambuang)	29	
Snacks	3	9.38
Total	**32**	**100.00**
Source of Seeds		
Their own	28	87.50
Within the community	3	9.38
Barter with other community	1	3.12
Total	**32**	**100.00**
Month of Planting		
Jan – Feb	-	-
Mar – Apr	-	-
May – June	-	-
July – Aug	-	-
Sept – Oct	-	-
Nov – Dec	32	100.00
Total	**32**	**100.00**
Varieties Planted		
Libo-libu	3	9.38
Kaubac	2	6.25
Perya	31	96.88
Sungi	2	6.25
Pilit	3	9.38
Buisan	3	9.38
Planting Area		
Rolling	-	-
Plain	9	28.12
Hilly	23	71.88
Total	**32**	**100.00**

Table 4. Ethnic tribe and educational attainment.

Organization	Frequency (n)	Percentage (%)
Senior Citizen	4	12.50
No Organization	28	87.50
Total	**32**	**100.00**
Ethnic Tribe		
Mandaya	31	96.88
Cebuano	-	-
Visaya	1	3.12
Boholano	-	-
Others	-	-
Total	**32**	**100.00**

Total	**32**	**100.00**
Educational Attainment		
Elementary Level	4	12.50
Elementary Graduate	16	50.00
High School Level	8	25.00
High School Graduate	3	9.38
College Level	-	-
College Graduate	1	3.12
Total	**32**	**100.00**

Seasonal calendar of the upland rice framing system

This significantly showed that during planting season until harvesting, upland rice farming was their major source of income. Planting was done in November to December, and harvesting was in April to May, depending on the planted varieties like Perya, Sungi, Pilit & Kaubac, which could be harvested for only three months (tres meses). November to December were the preferred months because the rainy season occurred in the summer time. However, crops were not free from rat infestation during the month of February to March, including April. Aside from seasons & events, which were determined during planting & harvesting, the role of the members of the family was well indicated. In this case, the major role of men was during planting, while the women played a major role during harvesting, specifically during post-harvest, particularly during seed selection, preservation, and storage. Children also helped in the post-harvest process. May and June were the preferred months in planting vegetables and root crops such as kamoteng kahoy and kamote so after three (3) months these crops are harvested to sustain the remaining months until harvest time of rice. In the months of January to March after planting of rice processed corn & rice for consumption was bought. Of course, after harvest food for consumption was highly available.

A secondary source of income like corn production was done in between rice farming Coffee, abaca and coconut were also planted to augment their income.

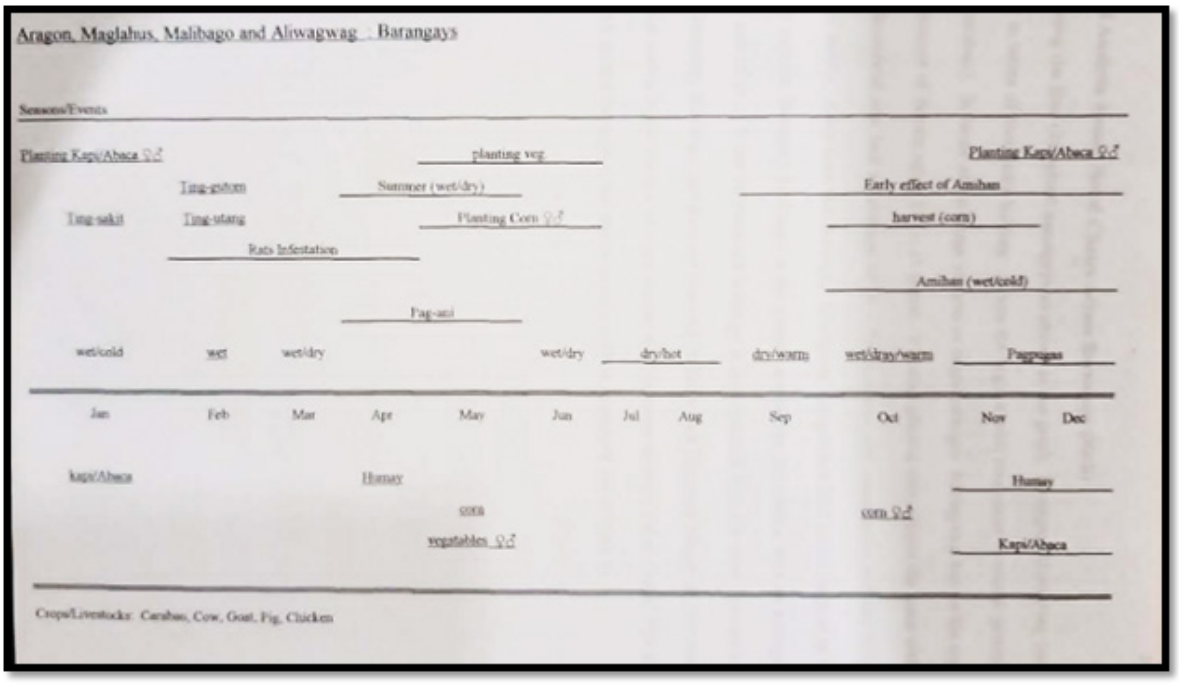

Figure 2. Seasonal calendar of the upland rice farming.

Livelihood analysis among social classes across barangays (Rich)

Among the four (4) upland barangays as shown in the graph barangay Aliwagwag was the richest in terms of livestock's holding. It was the highest with two major livestock present (cow and carabao). In terms of hectarage of farm or crops barangay Aliwagwag was on the top plus the presence of falcata aging (10-15 years). Varieties planted were almost the same with the rest. Household size had an average of (47) which was still manageable and can fully sustain their family Aside from that barangay Aliwagwag's respondent held power because he's a barangay captain. Barangay Malibago is the poorest among the rich classes with an average household size of (47) but its livestock holdings is incomparable with the other barangays. Although, barangay Malibago had diverse livestock holdings than Barangay Maglahos, this was compensated with a bigger hectare of crops planted with the same varieties, Perya, Sungi, Pilit & Kaubac. All upland barangays had approximately uniform household size.

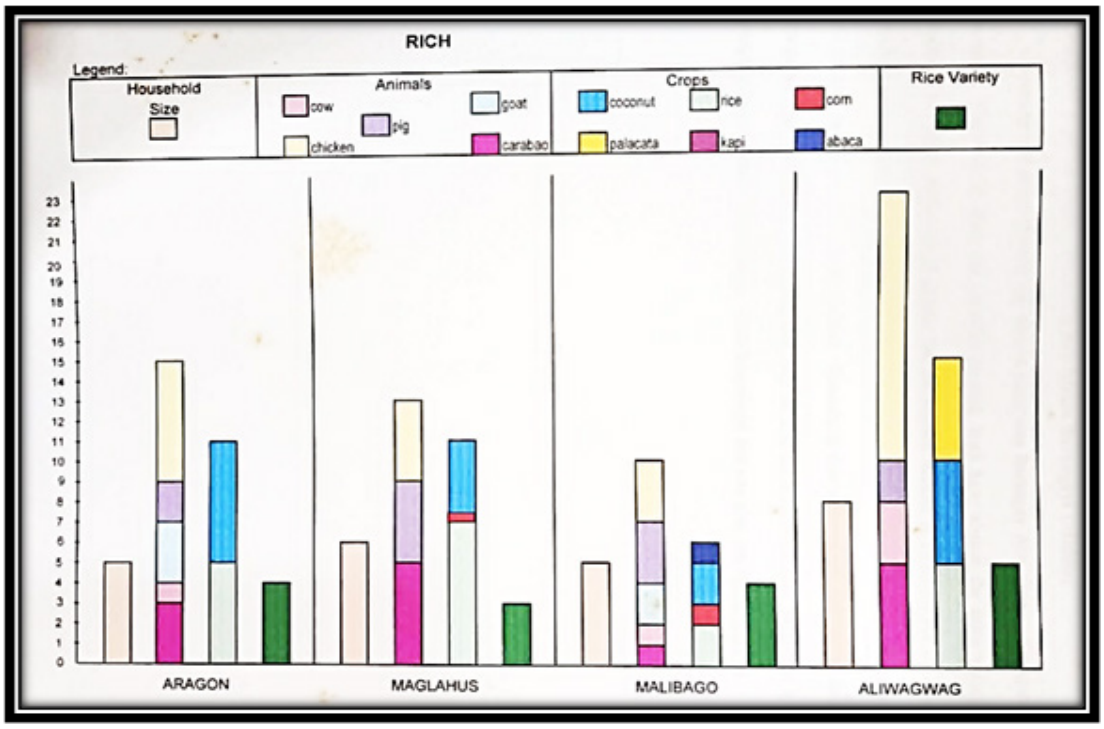

Figure 3. Livelihood analysis among social classes across barangays (rich).

Livelihood analysis among social classes across barangays (Middle)

Among the social classes, the middle class was Barangay Aliwagwag. Compared with Barangay Maglahus in terms of varieties planted, both have almost the same varieties and livestock holdings. Although Maglahus had the highest number in livestock, the number of chicken heads could be compensated with the number of one head of cow, considering that Aliwagwag had two (2) heads of carabao. Household size affected the stability of income in Barangay Maglahus while Aliwagwag had only an average household size. Maglahus is bigger than Malibago in terms of hectarage. Their household size was also average.

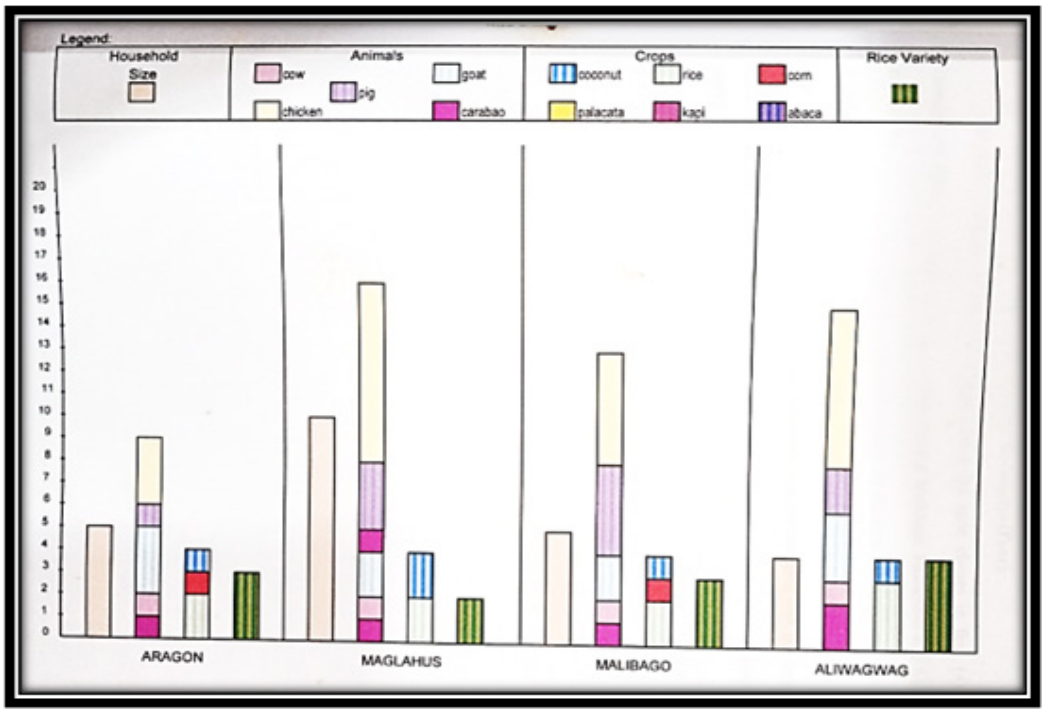

Figure 4. Livelihood analysis among social classes across barangays (middle).

Livelihood analysis among social classes across barangays (Poor)

Barangay Aliwagwag was the richest among the poor classes in the four (4) upland barangays in Cateel: Aliwagwag, Aragon, Maglahus, and Malibago. Household size was on average size of (67). Varieties planted in the four barangays were the same. Aliwagwag was the richest in livestock holdings as well as in hectares since this was planted with different crops. Compared with Aragon, Maglahus was compensated with the crops being planted in terms of hectarage. Thus, clearly Malibago indicated to be the poorest among their classes.

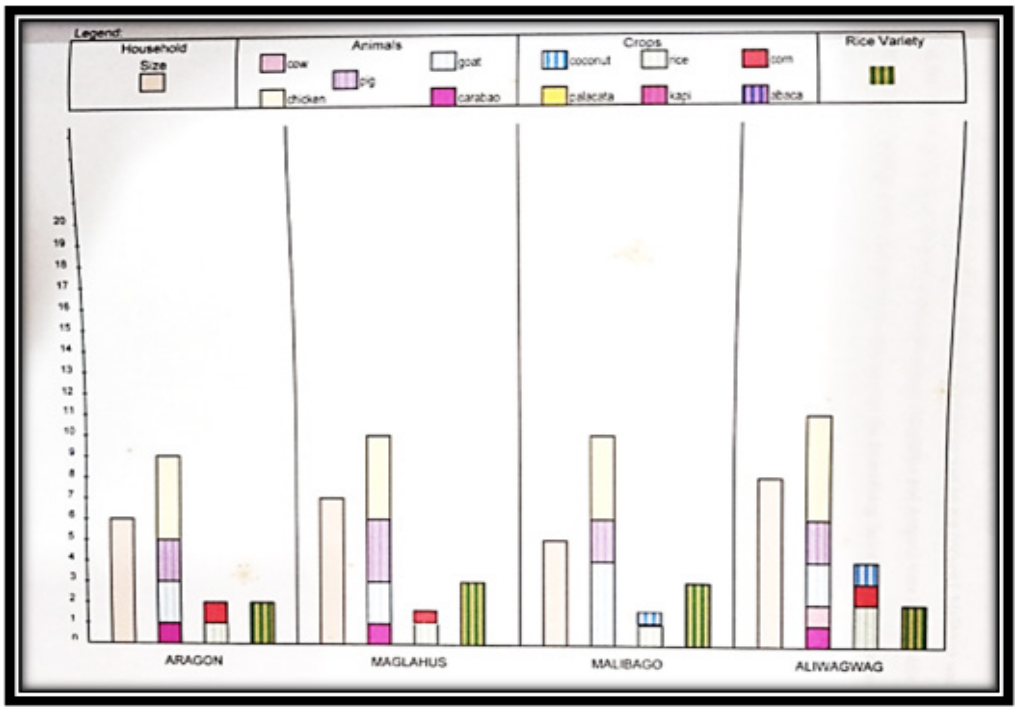

Figure 5. Livelihood analysis among social classes across barangays (poor).

Meta-analysis in livelihood analysis among three (3) social classes

Among these four (4) upland barangays, Aliwagwag was on top (richest), Malibago was at the bottom (poorest), and the two remaining barangays (Maglahus and Aragon) were in the middle. It was well identified that their household size was not the determining factor to classify richness and the poor. It was based on their livestock holdings and the hectarage of crops. Varieties planted were the same in these four (4) upland barangays. Among these three (3) social classes, the poor class had problems in sustaining the physiological needs of the family. Greater chances of selling livestock holding for security and immediate needs arose. However, this finding was based on a personal interview, and an arbitrary method was used. Upland rice farmers can be classified as Agriculture II based on Agrarian Reform Past Experiences - Future Prospects. These were farms cultivated by a family applying all its labor on the farm and living off the proceeds of the farm, but the farmer's goal was not to achieve the greatest possible profit, but rather the greatest security for survival, which was already threatened. These were called "marginal farms" as a result of poor natural conditions and the inadequate size of the land.

Market flow of upland rice farmers

The four (4) upland barangays of Cateel (Aliwagwag, Aragon, Maglahus, and Malibago) had the same flow diagram. Products supplied to the community were processed rice and corn, as well as physiological needs like feeds, kerosene, and rope. However, there were products going out in the communities, and these were either raw materials or livestock. Some of the raw materials were kapi, humay, corn, abaca, and coconut. Livestock were pigs and chickens. Both raw materials and livestock were sold in emergency and immediate cases. Most farmers, belonging to the poor social class, had a higher tendency to sell raw materials and livestock. The rich and middle classes sustain their physiological needs without selling their products. In the case of the Flow Diagram, rich, middle, and poor social classes had the same needs, and their physiological needs were based on Maslow's Hierarchy of Needs. According to Erich Fromm (1900-1980), these are human needs, in contrast to the more basic animal needs. From Maslow's Hierarchy of Needs, physiological needs, such as hunger, thirst, and bodily comforts, were most of the main concerns of the upland rice farmers. Based on the gathered fact-finding, the four upland barangays were self-reliant as a community.

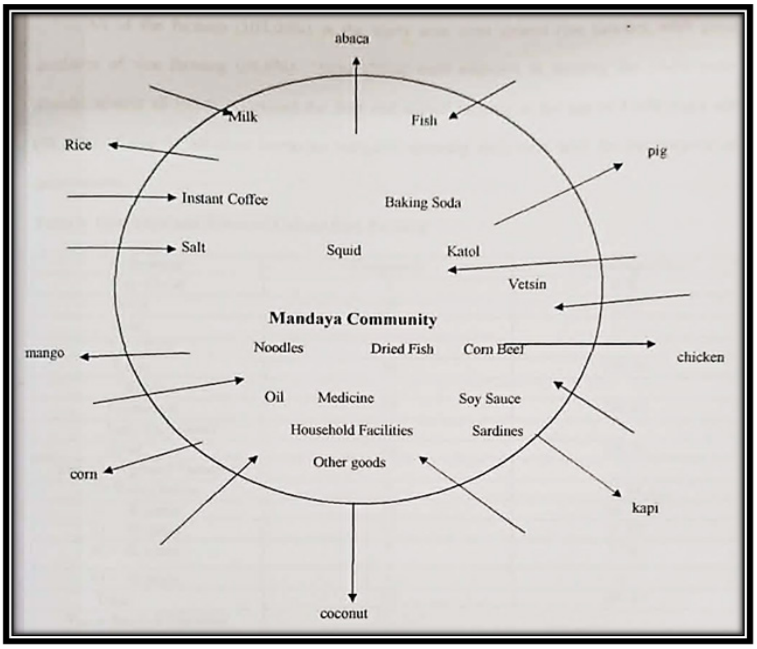

Figure 6. Market flow.

Condition and status of upland rice farming

All of the farmers (100.00%) in the study area were upland rice farmers, with good conditions of rice farming (90.6%). Most (75%) were engaged in farming for 15-30 years already, almost all (96.88%) owned the land and started farming at the age of 11-20 years old (78.13%). Maslow's hierarchy indicated securing their own land for safety needs.

MINDSCAPE

Quality of life of upland rice farmers

Results of quality and community life in the study areas for quality of life of the four (4) upland barangays gave much concentration on the presence of money (75%) and food in their homes (68.75%), approximately having the least priority. They were able to achieve five (5), satisfied five (5), enjoyed five (5) valued, but in terms of sustaining these needs five (5) meaning it was only good at first that they have these needs individually. In sustaining the basic needs it was hard for them as supported by the livelihood analysis (Figure 3) and seasonal calendar. Most poor classes had a higher tendency of these problems.

The upper social class can moderately sustain their needs based on previous results. Thus, it is fitted to Maslow's Hierarchy of Needs, securing first the physiological needs of the farmers, and these feelings motivate them to establish homeostasis (Motivation and Personality). Erikson added to the virtues of this age level of caring for the needs of the family. People are trustworthy, self-motivating, and self-governing. Humans tend towards growth and love. Or this level is generativity (concern for the future) and rejectivity. Overextended people tend to be ineffective and no longer contribute well. Rejectivity, on the other hand, was due to much generativity and stagnation; thus, they no longer participated in the community. Fromm added that these needs are human needs required before elevating to the next level of needs.

It was basically an important aspect in pursuing a good community, that peace and order (81 75%) was what they basically achieved, five (5), satisfied five (5), being enjoyed five (5). valued five (5) and sustained five (5). Second to that was understanding with each other (25%), and lastly abundance from farming (15.63%) (Table 7). If we try to look at these results, respondents mentioned that sustainable peace and order are not yet stable in the sense that war might occur anytime. Considering that year back there was a tremendous blow-up of cannons and firearms between the rebel group and the government troops. The theory of Freud (1856-1939) supported the result that life was not easy. The ego sits at the center of some pretty powerful forces: reality, society, as represented by the superego, and biology as represented by the id. With these many conflicting demands upon the four egos, it was understandable if it if you feel threatened and feel overwhelmed, or violence and other evils occurred when human needs were thwarted. People were deprived of lower needs, such as safety, which eventually led to violence. Believing that humans are not violent because they enjoy violence, partially reached Maslow's Second level of Hierarchy of Needs, which is safety needs.

Meta-analysis of the quality of life in upland rice farmers

This significantly showed that the respondents were just content with their normal life in the community. This was basically an output of stagnation in their levels. First and foremost, the farmers tended to comply with physiological needs but seemed to be stagnant in the sense that, in Maslow's theory (Motivation and Personality), they remain at the bottom of the pyramid of needs. The three important things in their individual life were money, food, and family. The first two needs were basically unsustainable; one is dependent on the other (money and food), and the other one was their maximum deficiency because the other two needs were

not sustainable and have not contributed much to the family situation. By principle, completing first those lower needs should be done before attaining the next level of need. At this age, only two tendencies were observed: one was overextension, and the others rejected. However, being overextended with the community was not possible because they didn't have the organization to cater to, and only a few had. Most likely, rejectivity occurred, too little generativity, and too much stagnation. Because of basic education, this led to psychological stress, resulting in the principle of "this is only what I can do" instead of thinking "what more can I do?".

With all these things happening, the individual life contributed to the status of the community life. A good community life is equated with peace and order being present. When an individual's life is ruined, and all other needs are affected and cease, a community is affected. Meaning, there is no possibility of having a good community, and farmers are just contented of what was there. When the "meaning of life" is that humans are "needs junkies" with cravings that must be satisfied and should be satisfied, else they become sick. Vygotsky (1929) said in his principle that the central fact about psychology is basically social in character, the relationship between individual and social environments is much more dynamic than the overly simple division often tacitly assumed. It is defined as the distance between the level of actual development and the more advanced level of potential development that came into existence in interaction between more and less capable participants.

Table 7. Semantic diagram of upland rice farmers.

Individual life	Frequency	%	Rank	Frequency	%	Community life
Money	24	75	1	27	84	Peace and order
Food in the home	22	69	2	10	31	Understanding with others
Living with the farming	8	25	3	5	16	Abundance from family

Indigenous land preservation

Farmers used organic fertilizer (100%) like dry leaves, which were used as fertilizers either burned (25%) or left to rot on land (65 60- 65%). Farmers had little knowledge of contour farming (12.50%). However, they valued the land very much since it provided them with a source of life (12.50%) and a source of livelihood (87 50%). These indigenous people had not changed their attitudes towards the use of land (100%). Indigenous knowledge, particularly in land preservation, was still one problem. This was due to some environmental problems caused by their lack of knowledge. Moreover, the absence of inorganic fertilizers can help preserve the land in its natural state. Unfortunately, other farmers burned the cut trees that help deplete the soil nutrients, leading to the occurrence of soil erosion. But still what as good was the minimal damage and tolerable impact on the environment. Agricultural scientists and extension agents asked the farmers to take steps in controlling soil erosion, especially measures that would appear to be cost effective. Indigenous people obtained these processes as widely accepted and believed that land degradation is an act of God or Allah (Diessel et al.,1998).

Table 8. Indigenous land preservation.

Fertilizers used	Frequency (n)	Percentage (%)
Organic	32	100.00
Inorganic	-	-

Utilization of dry leaves		
Burned	8	25.00
Used as fertilizers	21	65.62

Indigenous environmental perceptions

Farmers in the study areas expressed satisfaction with the conditions of the environment (100%) because they believed that they earned from this land. The environmental problems that were affected were drought (78.10%), and the belief of being responsible for whatever happens to the environment showed (100%). The fact of recognizing the presence of the environment affecting them is supported by the study of Alderfer's Hierarchy of Motivational Needs, growth as it impels a person to make creative and productive effects on himself and his environment. Thus, he is satisfied through using capabilities in engaging problems and creates a greater sense of wholeness and fullness as a human being.

Table 9. Indigenous environmental perceptions.

Satisfied with the condition of the environment	**Frequency (n)**	**Percentage (%)**
Yes	32	100.00
No	-	-
Total	**32**	**100.00**
Environmental problems		
Drought	25	78.12
Health	1	3.13
Pest Infestation	6	18.75
Total	**32**	**100.00**
Feeling of responsibility with the situation of the environment		
Yes	32	100.00
No	-	-
Total	**32**	**100.00**

Indigenous post-harvest practices

The four (4) upland barangays of Cateel such as aliwagwag, aragon, maglahus, and malibago, practiced indigenous post-harvest technology (100%) using kamarine, tambuang, limot, herbicides (100%) tanglad, katotis, leaves of alingatong, sili and sangig. Pesticides (96.9%) of the farmers were natural users, soil conservation (12.5%) practicing contour farming (87.5%) were not done (Table 10). According to Grewer (1998) of Indigenous Knowledge System, post-harvest practices is the sum total of the knowledge and skills which people in a particular geographic area possesses and be able to pass to their next generation. This is as well an effort to provide them with survival strategies; indeed, contour farming was somewhat a similar strategy used by indigenous people in Benguet Province in building the Banaue Rice Terraces. Contour farming is a conservation measure which farmers employ to prevent continuous soil erosion particularly in steep areas Land preparation and planting were described and explained in the book of Ulgasan 2004.

Table 10. Indigenous Post-harvest practices.

Post-harvest technology	**Frequency (n)**	**Percentage (%)**
Yes (Kamarine, Tambuang, Limot)	32	100.00

Yes (Kamarine, Tambuang, Limot)	32	100.00
No	-	-
Total	**32**	**100.00**
Herbicides		
Yes (Tanglad, Katotis, Alingatong, Sili and Sangig)	32	100.00
No	-	-
Total	**32**	**100.00**
Pesticides (Inorganic)		
Yes	1	3.12
No	31	96.88
Total	**32**	**100.00**
Soil Conservation		
Yes (Contour Farming)	4	12.50
No	28	87.50
Total	**32**	**100.00**

Cultural practices, physical condition and role of women in post-harvest.

The fact that Mandaya farmers sustained the cultural practices in planting rice and corn (93.8%), while (6.20%) were cultural practices performed to sick people. The physical conditions that bothered rice farming were drought (78.10%) and some were pest infestation (18.50%). Women, however, had played a role in the process of postharvest, such as selecting, preserving and storing the seeds (100%) (Table 11). Louise Grewer (1998) said traditional local knowledge existing within and developed around the specific conditions of women and men indigenous to a particular geographic area indicated shared farming knowledge is a divergent farming knowledge.

Harvesting

Harvesting was done by "hampasan" which was to detach the rice from the stalks, this was to remove the rice stalks from the "uhay" (stalks).

Threashing (Paggi-ok)

Threashing by trampling consists of laying large sheet of canvass mat, or sacks on a flat ground. Cattle or Carabaos were driven around until rice grains detached from the straw Winnowing or tossing the mixture into the air separate the chaff from the grains. Another way was use of flail; farmers beat the harvested rice with a flail or sticks. Then they took or sorted the rice to remove rice straws. Straws were tossed to remove the chaff, straw, dust and other fine trash. "Hampasan" system was a kind of activity where bundled rice stalks were whipped against a stone, wood slub or rack of bamboo slats. "Yabyaban" or taphan a process of separating the grains from the trash and only good grains remained and used.

Drying

Flatbed and continuous flow dryers were suitable for rice grains drying. The sun drying or air-drying system. Indigenous people also used improvised dryer like "abuhan".

Storage

Storage of grains used "tambuang" that is for long period of time. Another storage of rice was by means of "limor" or "bauyor" for consumption and immediate use. However, all storage type were placed in "pool" a house-like in "pawa" and to protect the stored rice grains

from insect's infestation. Leaves of alingatong, katutis, sangig, and tanglad were put since it provided unpleasant odor that hinder insects in penetrating the grains.

Milling (Paggaling)

Indigenous people used "paglubok" by means of "lubukan" which pounded the grain.

Table 11. Cultural practices, physical conditions and role of women in post-harvest.

Cultural Practices	Frequency (n)	Percentage (%)
Planting Rice and Corn	30	93.75
Sick Person	2	6.25
Total	**32**	**100.00**
Physical Condition		
Weather	-	-
Typhoon	1	3.13
Drought	25	78.12
Heavy rain	-	-
Pest Infestation	6	18.75
Total	**32**	**100.00**
Role of Women in Post- harvest		
Help men in planting (Select, preserve and store the seeds)	32	100.00
Tig pasweldo	-	-
Total	**32**	**100.00**

CONCLUSION

The study found that farmers aged 31-40, mostly male and married persons, had an average household size of 5-6. They were Mandaya who depended merely on upland rice farming and coconut farming and were low-income earners (P2, 000-P3, 000) who engaged in several farming systems like planting of corn, abaca, and engaged in small business. Mandaya communities continuously practiced Indigenous post-harvest practices, such as the use of Tambuang and Limot for seed storage in "pool" (house-like) and using only natural herbs for seed preservation and protection against insects and pests' infestation (tanglad, katutis, sangig, and leaves of alingatong). Manual operations were done during post-harvest. Threshing was done with the "feet" or by means of "Hampasan". Land is an important tool used as a planting area and a source of livelihood. Believing that these practices can help sustain the land's natural wealth, they perceived the land as their life, wealth, and most of all, a thing that they can leave with their children and never anticipate any change of attitude. Respondents valued the land as much as they valued their cultural norms, such as their practices and offerings. Members of the family were entirely devoted to life in upland rice farming. Women were usually the performers in the post-harvest activities, and children helped them too. With all variations, their farming system was critical when drought affected the planted crops. Normally, it resulted in loss of income and food for consumption. Indigenous people had their own way of land conservation, such as not endangering the quality of the environment, since organic materials were used. However, contour farming was also slowly used by these indigenous people.

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