



LOCAL CAPACITY ENHANCEMENT AND ENTERPRISE BUILDING IN HEIRLOOM RICE FARMING COMMUNITIES USING PARTICIPATORY NEEDS AND OPPORTUNITIES ASSESSMENT

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Abstract: *This study was conducted to gather data on the needs and opportunities for the improvement of the farmers specifically on the three sites of the project namely: Dangtalan and Balatoc, Pasil and Uma, Lubuagan through the use of the Participatory Needs and Opportunities (PNOA) tools. The PNOA tools that were used are Transect and resource Diagram, Cropping Calendar, Fears and Hopes Exercise, and Venn Diagram. The findings of the study show that land use and suitability, soil type and crops planted in the different sites of the project varied but with little similarities for the two neighboring municipalities of the project. On the other hand, farmers in Balatoc have a distinct problem that is adversely affecting their farming activities specifically the emission of sulfur from a volcano which is situated directly above the rice terraces in Fommag. It is then recommended that the Department of Agriculture as the lead agency in the project should address the problems and opportunities for improvement as identified by the farmers in the order of their priorities and based on the geographical feature as well as the climatic conditions in the three sites of the project.*

Keywords: *Participatory Needs and Opportunities, Department of Agriculture, farming activities, geographic features, climatic condition*

RATIONALE

Effective planning places unrivalled emphasis on mass participation and transparency. In this way, the intended beneficiaries of plans are able to analyze their own reality and



determine the propriety of interventions. As a result, they are collectively and individually empowered to pursue their own goals, live according to their values and culture, develop self-reliance, and enable them to make choices or decisions that shape their lives for the better.

Effective planning, too, equally places primacy on assessing the implications for men and women of any planned action and ensuring that their concerns and experiences are adequately considered in the design, implementation, monitoring and evaluation of all development activities such that any barriers between men and women are overcome.

It is through Participatory Needs and Opportunities Assessment (PNOA) by which the farmers thrash out among themselves their problems that are to be addressed as well as to plan for any interventions needed to address such problems. Using PNOA tools including transect and resource diagram, cropping calendar, fears and hopes exercises and Venn diagram, the facilitators who guided the farmers during the conduct of such activities were able to find out the different concerns of the farmers for possible interventions. It was a bottom-up, dialogue-oriented approach which strictly captured the Heirloom Rice Project mantra to its intended beneficiaries -- "... so that their aspirations and needs can be captured and do not get lost in the din of stronger voices" -- in relation to the eventual determination of development interventions purposefully intended for their socio-economic upliftment and the alleviation of their unfortunate plight.

From here on, the logical pursuit of actual development work can commence.

OBJECTIVES

General: To conduct participatory needs and opportunity assessment on the farming activities and rice-based ecosystems of heirloom rice farmers.

Specific:

1. To gather data on the physical features of the terraces specifically land use, soil type, crops planted, problems encountered from farming to marketing and opportunities for improvement and intervention;
2. To collect general information on the farming and post-harvest trends of heirloom rice farmers including indigenous and modern farming practices, rituals throughout the cropping cycle, cropping calendar and the different traditional rice varieties in the community;



3. To determine gender roles in the conduct of farming activities specifically the share of labor contributed by wife/husband in each activity;
4. To find out the aspirations of heirloom rice farmers in relation to the improvement of their farming activities and
5. To make recommendations on the most suitable, logical and preferred interventions based on the problems identified by the farmers.

METHODOLOGY

The researchers made use of Participatory Needs and Opportunities (PNOA) tools in gathering data from the three sites of the project namely: Dangtalan and Balatoc, Pasil and Uma, Lubuagan. The PNOA tools that were used are Transect and resource diagram, Cropping calendar, Fears and Hopes Exercise and Venn diagram.

a. Transect and Resource Diagram

Using transect and resource diagram, the farmer-participants together with the facilitators walk around the farm sites and assess the area together. Among the important attributes observed and recorded by the farmers include total land area including areas of water, topography, slope, terrain, elevation, vegetation, forestry, agro forestry indicating watershed areas, soil types, land suitability and land use.

With the assistance of facilitators, participants work together to create a transect diagram, indicating the agro-ecological characteristics of the site (land types, resources, crops & cropping pattern, varieties and hydrology).

b. Cropping Calendar

Using cropping calendar, the farmers work together to create a crop calendar indicating farming activities for each month of the year, along with varieties planted, types of material inputs used, labor used (male/female), wages (male/female), payment system for services used during entire season, pests and diseases, marketing, problems and opportunities. This tool supports farmers and agriculture extensionists across the world in taking appropriate decisions on crops and their sowing period (FAO, 2013).

c. Fears and Hopes

The farmers were given meta-cards and markers. They are given ample time to discuss their fears with regard to heirloom rice farming. Fears are typically identified with existing problems. It may also include perceived future problem.



Using the meta-cards, participants write keywords of these “fears” and post it in the section provided. After all meta-cards for fears are posted, a second set of meta-cards (different color) is distributed. This time, participants write down what they perceive as opportunities for them. This can be things they think will address their “fears”, although it need not be the case. Using the meta-cards, participants write keywords of these “opportunities” and post it in the section provided.

After posting their fears and hopes/opportunities, the participants chose among themselves one who will explain what they have earlier posted.

d. Venn Diagram

Under this PNOA tool, participants are asked to list the different institutions in the village and discuss the roles of these institutions and ranked them according to their importance or contribution with regards to the SHG’s objectives/needs. Using round cards of different sizes, participants will indicate the importance of each institution using the size of the card. The group will decide which ones get large, medium, or small card.

RESULTS AND DISCUSSIONS

A. Transect and Resource Diagram

Land Use. A vast area of the land resource of Dangtalan is primarily used for agriculture specifically rice and vegetable production. The abundant water resources, cold climate and the terraces in the area make it suitable for traditional rice farming. Other land uses include residential where houses, churches, school and the community seed bank are built. A small area is also reserved as *imong*, an area reserved and planted with trees for lumber purposes.

Soil Type. The type of soil in areas where rice fields are situated is typically clay and sandy loam making it suitable for rice farming. The same type of soil is attributed to residential and *imong* areas. In contrast, the mountains where small trees and plants are grown are piled up with rocks and stones making them less susceptible to erosions.

Crops Planted. Rice terraces are primarily planted with traditional rice varieties (heirloom rice) especially during dry season of January to June and modern varieties during months of July to December. Other agricultural lands are planted with trees, fruits (coffee, banana, coconut, mango, avocado, etc.), tiger grass, and a variety of vegetables.

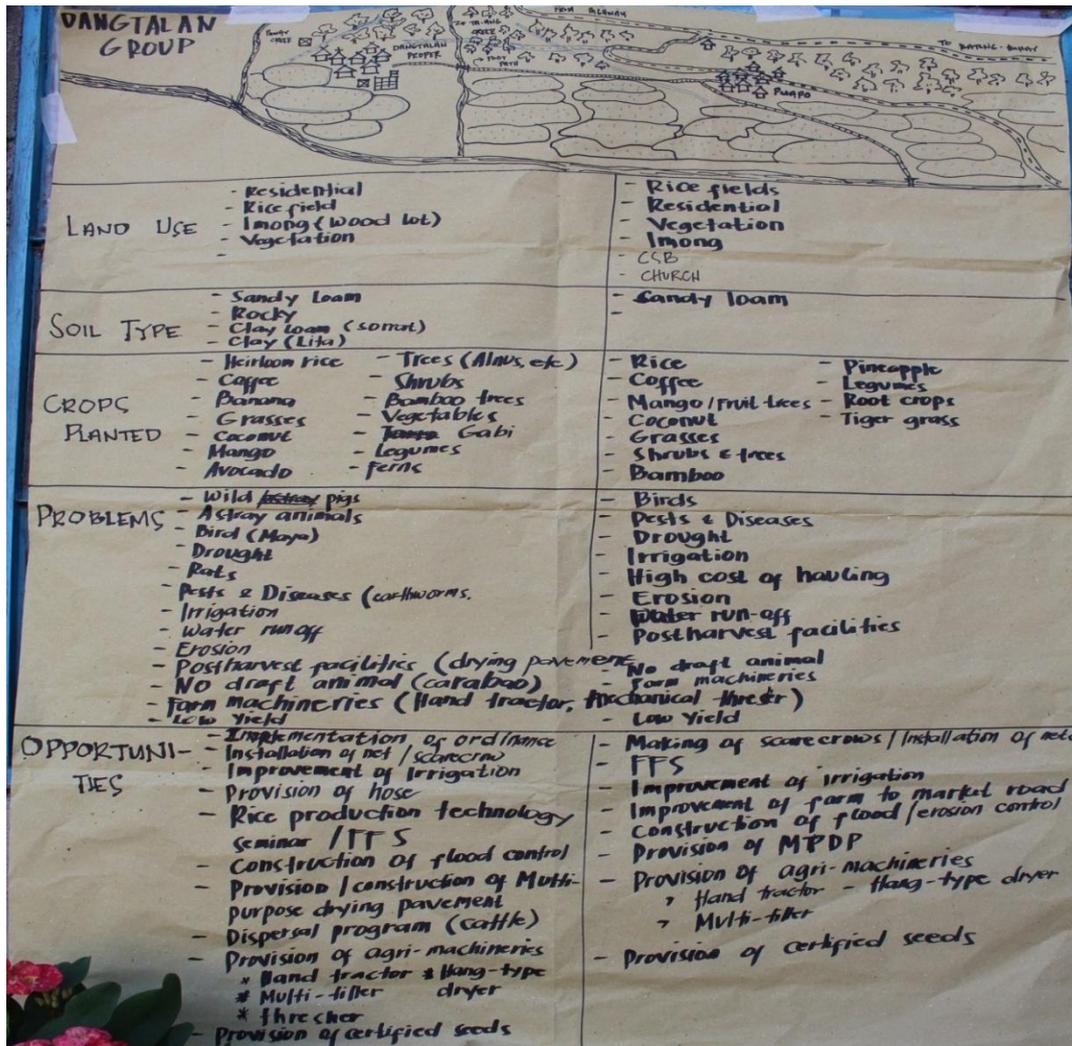


Figure A-1: Transect Diagram of Barangay Dangtalan, Pasil

Problems. The farmers identified a number of problems during their farming activities. These include wild and astray animals, birds, rats, pests and diseases, drought, erosion, irrigation and farm seepage, lack of farm machineries and post-harvest facilities, lack of draft carabao and low yields during harvests.

Opportunities for Improvement/Intervention. The following were suggested and recommended by the farmers as opportunities for improvement:

- ✓ Implementation of barangay ordinances on stray animals
- ✓ Installation of net/scarecrow to catch or drive away birds
- ✓ Farmers Filed School on traditional and modern rice production technology
- ✓ Construction of irrigation systems and multi-purpose drying pavement
- ✓ Provision of farm machineries and post-harvest facilities
- ✓ Dispersal programs such as distribution of carabaos to deserving farmers



- ✓ Improvement of farm-to-market roads
- ✓ Provision of certified seeds.

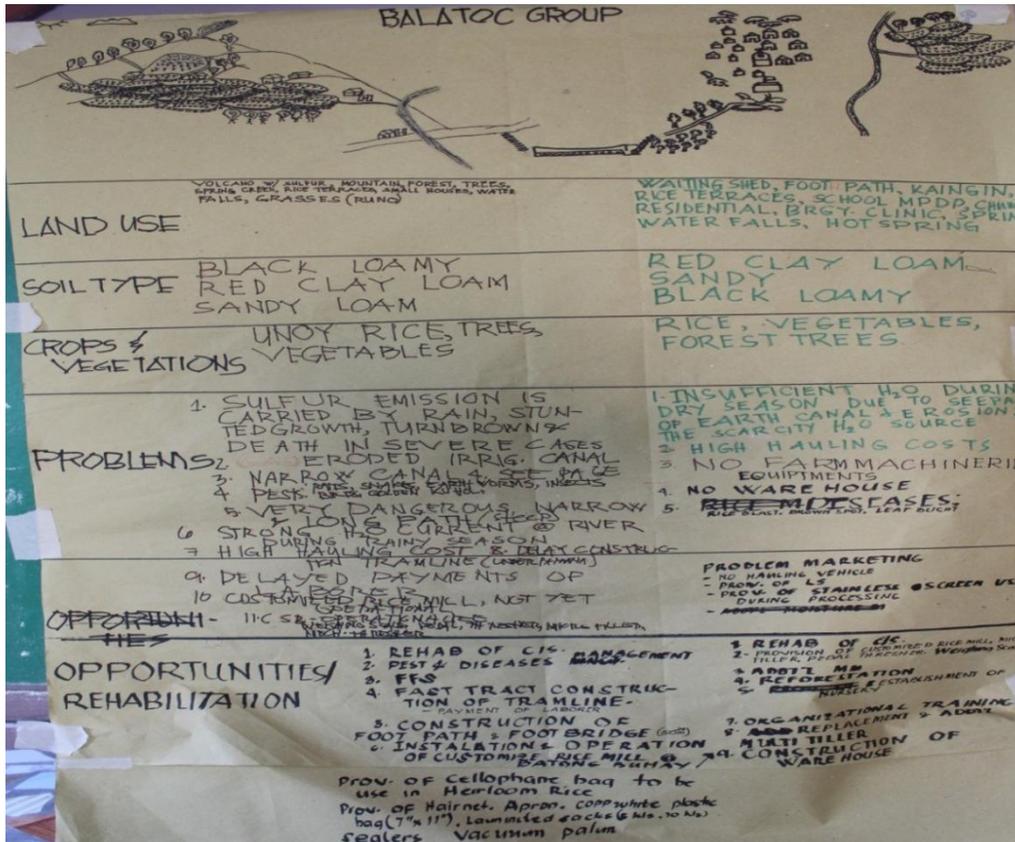


Figure A-2: Transect Diagram of Barangay Balatoc, Pasil

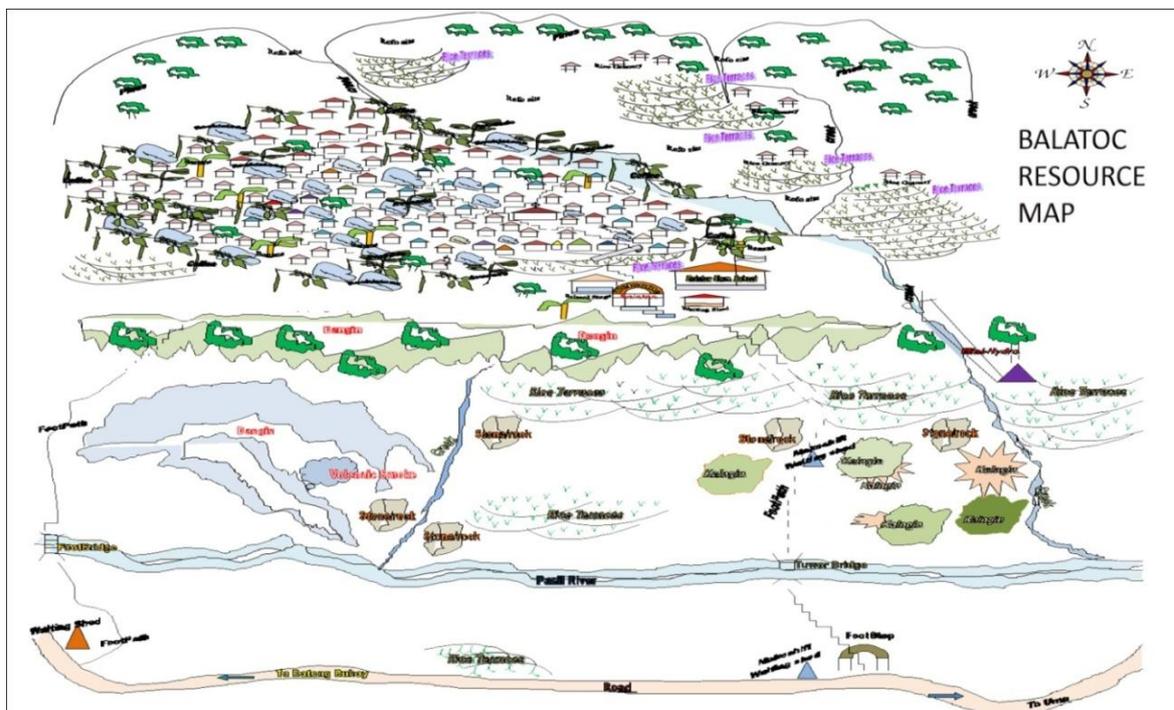


Figure A-3. Resource Map of Barangay Balatoc



Table 1 – Distribution of Land Use in the Barangay

Type of Land Use	Approximate Area (in ha.)	Percentage
Forest	5,180.00	60.10
Pasture land	1,320.50	15.32
Grass land	2,000.00	23.20
Agricultural area	95	1.10
Residential area	18.5	0.21
Water bodies	5	0.06
TOTAL	8,619	100.00

Source: MTDP 2005-2010

Land Suitability and Land Use

Table 1 depicts the land use for Barangay Balatoc. Residential use (.21%) pertains to areas (*sa-ad*) where family dwellings are built or the area (*Foforoy*) where the cluster of dwellings which comprise the village is located. The residential areas are relatively of flat or leveled terrain. Clustering of houses is made imperative by security reasons.

The forest (*kinuwhat*) (60.10%) pertains to areas inclusive of mountain ranges, ridges, and wood lots which provide the village with forest products and, are, therefore basically of lush vegetation. However, within the barangay's forest are production areas: the *uma* or *kaingin* where farmers grow cash crops such as legumes, upland rice, vegetables, and root crops; the *ay-aju* which serves as woodlot and watershed source catchment area. The *uma* areas of Balatoc are the designated locations for growing mung beans and are situated in the higher areas/locations. The estimated aggregate production area in this respect approximates, more or less, 8 hectares.

The agricultural area (1.10%) pertains to manually-constructed rice paddies along the mountain sides and swidden farms (*uma*) in the forest production area where people undertake *kaingin* to produce non-irrigated crops such as upland rice, legumes, vegetables, and root crops. The grassland area (23.20%) pertains to open/denuded areas of either rolling or gentle slopes suitable for grazing of animals where grass grows in abundance. Water bodies (.06%) pertain to rivers (*Whurog*) and creeks (*gwanggwang*) or those used as source of freshwater fish and irrigation.

Soil Type and Rooting Depth. The soil permeability in the area ranges from slow to moderate. Generally, the soil in the area is relatively fertile with high organic content. This condition would be very favorable to the growth of tropical crops. The soil types in the barangay are clay loam, loam, and sandy clay loam. The rooting depth for trees is at 3.7



meters while crop roots grow at a depth of 1 meter. The climate and soil of the barangay is suitable to growing of diverse tropical crops and trees.

Crops Planted. Rice terraces are primarily planted with traditional rice varieties (heirloom rice) specifically *Unoy* during dry season of January to June and *Oyak* during months of July to December. Other agricultural lands are planted with Bush Sitao, Cassava, Sugarcane, Gabi, Ginger, Snap Beans, Squash, Camote, White Corn, Native Cabbage and Coffee.

Problems. The farmers in Barangay Balatoc identified a distinct problem in their farming activities which is the emission of sulfur from a volcano which is situated directly above the rice terraces in *Fommag*. The sulfur is causing stunted growth of rice and other crops on agricultural lands below the volcano. Other problems identified include insufficient irrigation supply during dry season, pests and diseases, high hauling costs, lack of farm machineries and post-harvest facilities, dangerous narrow pathway, and lack of customized rice mill and processing equipment of heirloom rice.

Opportunities for Improvement/Intervention. The following were suggested and recommended by the farmers as opportunities for improvement:

- ✓ Rehabilitation of communal irrigations systems
- ✓ Farmers field schools (trainings/seminars on organic farming, marketing and bookkeeping)
- ✓ Reforestation of denuded forests
- ✓ Construction of footpath and Foot Bridge
- ✓ Provision of farm equipment (Pre and post-harvest facilities)
- ✓ Provision of customized rice mill and processing equipment

Table 2. Land Use in the Barangay

Type of Land Use	Approximate Area	Percentage
Forest	5,090.55	70.21
Pasture land	284.00	3.92
Grass land	1,752.00	24.16
Agricultural area	113.10	1.56
Residential area	7.50	0.10
Water bodies	3.25	0.04
TOTAL	7,250.40	100

Source: Records of Assessor's Office and Department of Agriculture

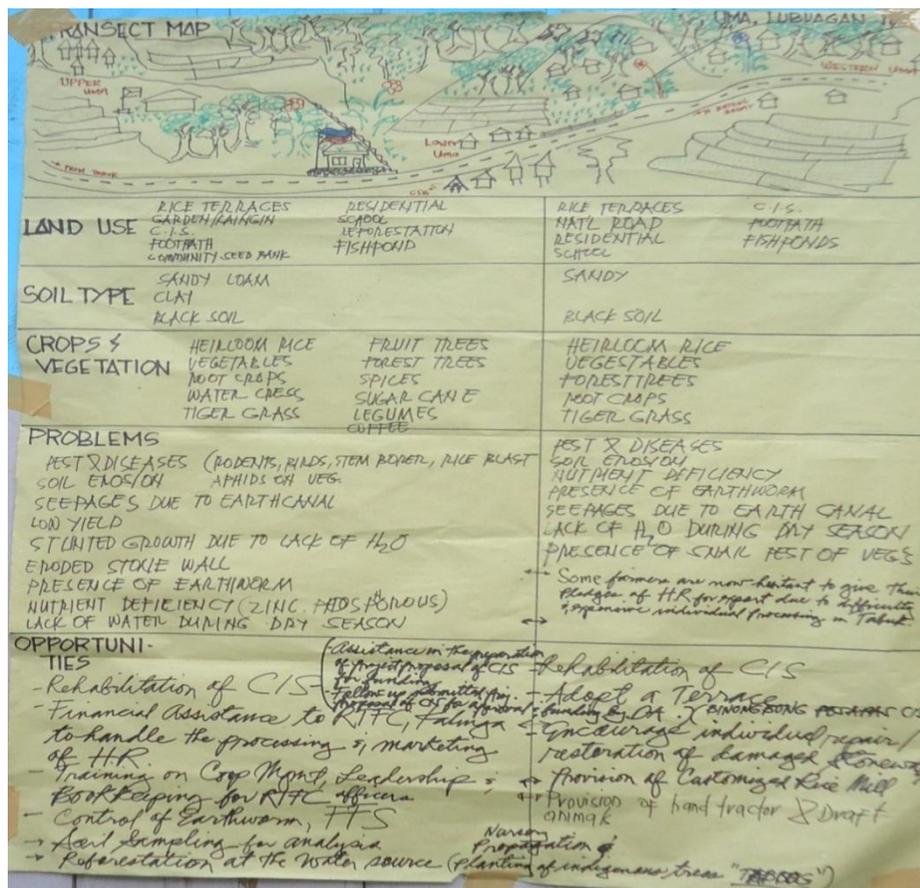


Figure A-4: Transect Diagram of Barangay Lower Uma, Lubuagan

Land Suitability and Land Use

Table 2 depicts the land use for Barangay Uma. Residential use (0.10%) pertains to areas (*saad*) where family dwellings are built or the area (*boboloy*) where the cluster of dwellings which comprise the village is located. The residential areas are relatively of flat terrain. Clustering of houses is made imperative by security reasons.

The forest (70.21%) pertains to areas inclusive of mountain ranges, ridges, and wood lots which provide the village with forest products and, are, therefore basically of lush vegetation. However, within the barangay's forest are production areas: the *uma* or kaingin where farmers grow cash crops such as legumes, upland rice, vegetables, and root crops;

The pasture land areas (3.92%) pertain to areas where community graze their large animals particularly carabao and cattles because of bountiful grass.

The agricultural area (1.56%) pertains to manually-constructed rice paddies along the mountain sides and swidden farms (*uma*) within the forest buffer zone/production area where non-irrigated crops grow such as upland rice, legumes, vegetables, and root crops.



The grassland area (24.16%) pertains to open/denuded areas in the forest production area because of *kaingin* and which is undergoing a fallow period, thus looks barren without any intensive farming activity being done on it.

Water bodies (0.04%) pertain to rivers and creeks or those used as source of freshwater fish and irrigation.

The soil permeability in Barangay Upper Uma ranges from slow to moderate. Generally, the soil in the area is relatively fertile with high organic content. This condition is favorable to the growth of tropical crops.

Soil Type and Rooting Depth. The soil types in the barangay are loamy black soil, clay loam, and unclassified mountain soil. In this regard, slope areas situated in plateaus where settlement is located have a slow drainage with water holding capacity considered as moderate to high. Trees have a rooting depth of 3.7m and a moderate to rapid water holding capacity. Rooting depth for crops is from 2 meters.

Crops Planted. A large area of their agricultural land is planted with traditional rice varieties. Other crops planted are coffee, tongsoy, sayote, beans, camote and tiger grass. Most of the steeper areas that cannot be planted with vegetables and rice are planted with tiger grass, the primary input for making soft brooms which is also one of their primary products.

Problems. Among the problems identified by the farmers are pests and diseases, soil erosion, water seepage, stunted growth due to lack of water supply, insufficient irrigation supply during dry season, eroded stonewall, nutrients deficiency (zinc), and low yield during harvests.

Opportunities. The following are opportunities for improvement or areas for intervention as identified by the farmers:

- ✓ Rehabilitation of communal irrigation systems
- ✓ Financial assistance to RTFC Kalinga to handle processing and marketing of heirloom rice
- ✓ Farmers Field Schools (Organic farming, bookkeeping, crop management and leadership)
- ✓ Restoration of damaged terraces
- ✓ Soil sampling for analysis
- ✓ Provision of hand tractor and draft animals
- ✓ Provision of customized rice mill



B. Cropping Pattern and Calendar

Table B-1. Cropping Pattern and Calendar (Barangay Dangtalan, Pasil)

MONTHS	January	February	March	April	May	June	July	August	September	October	November	December
RAINFALL												
ACTIVITIES	Sowing Land Preparation Transplanting		Weeding Water Management Putting up of scarecrows		Harvesting Sowing		Land Preparation Transplanting		Weeding Water Management Putting up of scarecrows		Harvesting Sowing	
LABOR INPUTS	Innabuyog (Labor exchange) Hired Labor @ P200/day (Male & Female)						Innabuyog (Labor exchange) Hired Labor @ P200/day (Male & Female)				Innabuyog (Labor exchange) Hired Labor @ P200/day (Male & Female)	
PESTS & DISEASES	Rats, birds, chicken, earthworm, leaf borers, snails, rice bugs						Rats, birds, chicken, earthworm, leaf borers, snails, rice bugs					
PRICE & MARKETS	Export: Unoy (Cong-ak) @ P60/kg Ulikan Red @ P58/kg ChaykotAllig (glutinous) @ P80/kg *25 – 30 % - Sold to local/foreign market *70 – 75% - For consumption											
PROBLEMS	Pests and Diseases (Birds, rats, snails, chicken, rice bug, stemborer, mole cricket) Lack of draft animal and farm implements (multi-tiller for land preparation) Lack of pre and post-harvest facilities Lack of accessible customized rice mill Damaged irrigation canals and rice terraces Soil nutrients deficiency Low price of palay and clean rice											



Table B-2. Cropping Pattern and Calendar (Barangay Balatoc, Pasil)

MONTHS	January	February	March	April	May	June	July	August	September	October	November	December
RAINFALL												
VARIETIES GROWN	Unoy -Ifuwan -Ulikan -Chaykot (red) -Oyak white -Mila -Finangad						-Finontok -Lumpaga -Ingtan (red) -Kusimay -Kamuros					
LABOR/ ACTIVITIES	Transplanting		Weeding Water Management				Harvesting		Processing/packing			
LABOR INPUTS	Hired Labor @ P250 or 300/day (Male & Female)						Hired Labor @ P250 or 300/day (Male & Female)				Hired Labor @ P250 or 300/day (Male & Female)	
OTHER ACTIVITIES		Planting of other crops (white corn) Other livelihood					Transportation of harvest to Tabuk City					
PESTS & DISEASES	Earthworm, golden kuhol, rats, snakes, birds, stem borer						Earthworm, golden kuhol, rats, snakes, birds, stem borer					
PRICE & MARKETS	Average yield: 3 – 5 tons/hectare P60/kilo – milled (export) P40/kilo – palay P200/kilo – (local market)											
PROBLEMS	Lack of manpower Attack from pests and diseases Malfunctioning machineries High costs of hauling Lack of footbridge/footpath											



Table B-3. Cropping Pattern and Calendar (Barangay Uma, Lubuagan)

MONTHS	January	February	March	April	May	June	July	August	September	October	November	December
RAINFALL												
LABOR/ ACTIVITIES	Transplanting		Weeding Water Management Crop care Installation of scarecrow		Harvesting Sowing (for next cropping)			Weeding Water Management Crop care Installation of scarecrow			Harvesting Sowing (for next cropping) Land preparation	
LABOR INPUTS	Hired Labor @ P150/day (Male & Female) Innabuyog (exchange of labor)						Hired Labor @ P150/day (Male & Female) Innabuyog (exchange of labor)				Hired Labor @ P150/day (Male & Female) Innabuyog (exchange of labor)	
OTHER ACTIVITIES			Slash and burn agriculture (kaingin) Planting of legumes, camote, gabi, mais, cassava, vegetables								Kaingin, planting of other crops	
PESTS & DISEASES	Stem borer, rice bugs, blasts, rats, birds, earthworm, snails (golden kuhol)						Stem borer, rice bugs, blasts, rats, birds, earthworm, snails (golden kuhol)					
PRICE & MARKETS	Average yield: 3 – 5 tons/hectare P60/kilo – milled (export) *minimum of 25kg as pledge P40/kilo – palay P80/kilo – (local market)											
PROBLEMS	Pests and diseases High cost of inputs Low yield (shortage of supply for consumption) Nutrients deficiency of rice fields Lack of draft animal for land preparation Lack of pre and post-harvest facilities Lack of credit/loan assistance											
OPPORTUNI TIES	Rice production technology trainings (FFS) Loan assistance Soil testing/analysis to determine soil nutrients deficiency Provision of micro-tiller, knapsack sprayer, mini thresher & customized rice mill Linkage to new markets											



C. Fears and Hopes

Table C-1: Fears and Hopes (Barangay Dangtalan)

FEARS	HOPES
Earthworm (big and small)	High yield
Drought	More tillers
Stem Borer (White heads)	Rehabilitation of irrigation canals
Leaf blasts	Provision of draft animal
Stunted growth	Village type customized rice mill
Seepage	Processing center
Typhoon	Farm to market road
Golden kuhol	Training on pest and diseases management
Soil nutrients deficiency	Increase in price of exported rice
Landslides	Financial assistance to farmers
Rats	Plastic pipes for water supply
Bad seeds	Increase in harvest
Lack of draft carabao	
Low yield	
Army worm	

Table C-2: Fears and Hopes (Barangay Balatoc)

FEARS	HOPES
Tribal war	Warehouse
Soil nutrients deficiency (zinc)	Micro-tiller
Eroded irrigation canals	Tramline
Low production due to climate change like drought and typhoon	Village-type customized rice mill
Golden kuhol (snails)	Financial assistance to farmers
Lower price	Communal irrigation system improvement
Rice blasts	Foot bridge over momma river
Earthworm	Livelihood project during off-season
Rats and snails	Multi-purpose during pavement
Drought	Farm to market road
Long distance of farm gates to access road	Increase in yield

Table C-3: Fears and Hopes (Barangay Upper Uma, Lower Uma & Western Uma)

FEARS	HOPES
Typhoon	Provision of hand tractor & draft animal
Landslides	Improvement of communal irrigation system
Eroded irrigation canals	Multi-purpose drying pavement
Earthworm	Thresher and customized rice mill
Rice blasts	Processing center
White panicles	Provision of warehouse storage
Lack of water during dry season	Increase in prices of rice
Lack of hand tractor, farm tools, wheel barrow, spray bar, rice mill	Financial assistance to farmers
Lack of seeds	
Low price	
Water seepage	

D. Venn Diagram



Figure D-1: Venn Diagram (Barangay Dangtalan)

List of institutions/agencies (government and private) which the SHG perceived as having contributed to their needs as well as the attainment of their objectives (For UnoyPasil Terraces Association – Dangtalan, Pasil)

1. Department of Agriculture (DA)
2. Philippine Rice Research Institute (PhilRice)
3. International Rice Research Institute (IRRI)
4. Revitalize Indigenous Cordillera Entrepreneurs (RICE, Inc.)
5. Kalinga-Apayao State College (KASC)
6. Department of Agrarian Reform (DAR)
7. Department of Science and Technology (DOST)
8. Department of Social Welfare and Development (DSWD)

9. Department of Public Works and Highways (DPWH)
10. National Irrigation Administration (NIA)
11. Department of Trade and Industry (DTI)
12. KapitBisig Laban saKahirapan (KALAHI)
13. Provincial Local Government Unit (PLGU)
14. Municipal Local Government Unit (MLGU)
15. Barangay Local Government Unit (BLGU)



Figure D-2: Venn Diagram (Barangay Balatoc – Balatoc Terraces Farmers’ Association)

List of institutions/agencies (government and private) which the SHG perceived to have contributed to their needs as well as the attainment of their objectives (for Balatoc Terraces Farmers’ Association – Balatoc, Pasil)

1. Department of Agriculture (DA)
2. Makilala Mining Corporation, Inc. (MMCI)
3. Revitalize Indigenous Cordillera Entrepreneurs (RICE, Inc.)
4. 8th Wonder

5. Philippine Rice Research Institute (PhilRice)
6. International Rice Research Institute (IRRI)
7. Kalinga-Apayao State College (KASC)
8. Municipal Local Government Unit (MLGU)
9. Department of Trade and Industry (DTI)
10. Department of Science and Technology (DOST)
11. Provincial Local Government Unit (PLGU)
12. Cordillera Highland Agricultural Resource Management Project 2 (CHARMP 2)
13. Department of Agrarian Reform (DAR)
14. Agricultural Training Institute (ATI)
15. Municipal Social Welfare and Development (DSWD)
16. Barangay Local Government Unit (BLGU)
17. Level Ground Company
18. Balatoc Kalinga Tribe Incorporated (BKTI)
19. National Irrigation Administration (NIA)

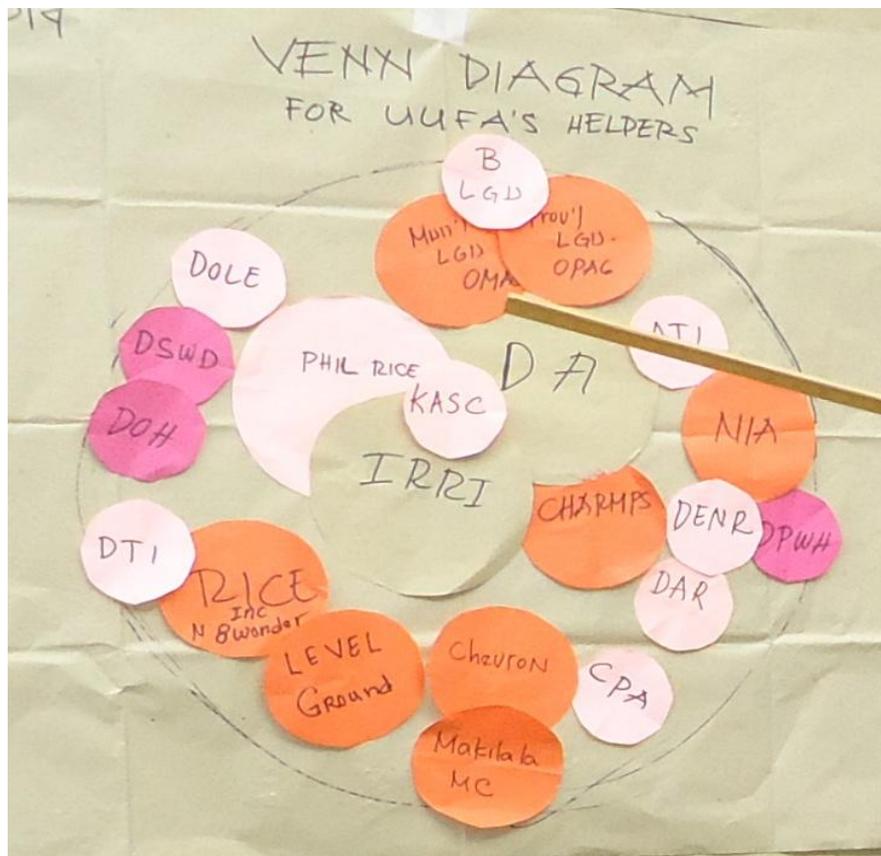


Figure D-3: Venn Diagram (Barangay Lower Uma – Uma Unoy Farmers Association)



List of institutions/agencies (government and private) which the SHG perceived as having contributed to their needs as well as the attainment of their objectives (for Uma Unoy Farmers Association – Lower Uma, Lubuagan)

1. Philippine Rice Research Institute (Philrice)
2. Department of Agriculture (DA)
3. International Rice Research Institute (IRRI)
4. RICE, Inc.
5. 8th Wonder
6. Level Ground Company
7. Makilala Mining Corporation, Inc. (MMCI)
8. CHEVRON
9. Cordillera Highland Agricultural Resource Management Project 2 (CHARM 2)
10. National Irrigation Administration (NIA)
11. Provincial Local Government Unit (PLGU)
12. Municipal Local Government Unit (MLGU)
13. Barangay Local Government Unit (BLGU)
14. Agricultural Training Institute (ATI)
15. Department of Environment and Natural Resources
16. Department of Agrarian Reform (DAR)
17. CPA
18. Kalinga-Apayao State College (KASC)
19. Department of Labor and Employment (DOLE)
20. Department of Trade and Industry (DTI)
21. Department of Social Welfare and Development (DSWD)
22. Department of Health (DOH)
23. Department of Public Works and Highways (DPWH)

CONCLUSIONS

Based from the data gathered, the following conclusions were drawn:

1. The land use and suitability, soil type and crops planted in the different sites of the project varied with little similarities for the two neighboring municipalities.



2. The farmers in the three sites identified common problems in their farming activities. These include wild and stray animals, birds, rats, pests and diseases, drought, erosion, irrigation and farm seepage, zinc deficiency, lack of farm machineries and post-harvest facilities, lack of draft carabao, low yields during harvests, dangerous narrow pathway and lack of customized rice mill and processing equipment of heirloom rice.

On the other hand, farmers in Balatoc have a distinct problem that is adversely affecting their farming activities specifically the emission of sulfur from a volcano which is situated directly above the rice terraces in *Fommag* which is causing stunted growth of rice and other crops on agricultural lands below the volcano.

3. Farmers from the three sites identified opportunities for improvement which are as follows: implementation of barangay ordinances on stray animals, installation of net/scarecrow to catch or drive away birds, Farmers Field School on traditional and modern rice production technology (organic farming, bookkeeping, crop management and leadership), construction of irrigation systems and multi-purpose drying pavement, provision of farm machineries and post-harvest facilities, dispersal programs such as distribution of carabaos to deserving farmers, improvement of farm-to-market roads, provision of certified seeds, reforestation of denuded forests, construction of footpath and foot bridge, provision of farm equipment (pre and post-harvest facilities), Farmers Field School's Restoration of damaged terraces and soil sampling for analysis.
4. Except for Dangtalan whose dry season starts from January to April, Balatoc and Uma experienced dry season only during the months of March and April. For dry season, land preparation and transplanting in the three sites are done during the months of January and February. Harvesting is done during the months of May and June in Dangtalan and Uma except for Balatoc which is done during month of July. The delay in the harvest in Balatoc is caused by the relatively cold climate in the area. On the average, the cost of one day labor is PhP200 and more often than not, farmers resort to labor exchange and all farm activities are both performed by males and females. The average yield in all the three sites is 3-5 tons per hectare and 30% of the harvest is either sold in the local or foreign markets.



5. Among the targets of the farmers in the three sites are increase in their yield, rehabilitation of irrigation canals, provision of draft animal, village-type customized rice mill, processing center, farm to market road, training on pest and diseases management, increase in price of exported rice, financial assistance to farmers, plastic pipes for water supply, increase in harvest, warehouse, micro-tiller, tramline, livelihood project during off-season, multi-purpose during pavement, farm to market road and increase in prices.

RECOMMENDATIONS

Based from the findings and conclusions of the study, the following are recommended:

1. The Department of Agriculture as the lead agency in the project should address the problems and opportunities for improvement as identified by the farmers in the order of their priorities and based on the geographical feature as well as the climatic conditions in the three sites of the project.
2. The farmers should adopt synchronize farming among themselves in order to minimize the damages caused by pests and diseases.
3. To address the problems on organic farming as well as pests and diseases, a farmer field school should be formed to train farmers on Pest and Diseases management and production of organic fertilizers.
4. A village-type customized rice mill should be built in a strategic area which is accessible to farmers from the three sites.
5. It should be a priority for intervention the provision pre and post-harvest facilities such as micro tillers, hand tractors and construction of multi-purpose pavement and warehouse for storage of the farmers' produce.
6. The lead agency should also set as a priority the restoration of rice terraces as well as the repair and construction of communal irrigation systems.

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