

# Productivity and Livelihood Analysis of Selected Areas of Libon, Albay, Philippines

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**Abstract-** *The study was undertaken to assess the productive capacity of the proposed Organic Agriculture-Based Social Enterprise (OABSE) program areas and generate livelihood management options. The methodological approach used was the Sustainable Livelihoods Analysis (SLA) Framework to assess the productive and livelihood capacity of the agricultural communities of Ponso, Sagrada Familia, Villa Petrona, Nogpo and Libtong in Libon, Albay. The SLA framework assesses productive capacity in terms of access of the farming households to livelihood assets such as social capital, human capital, financial capital, natural capital and physical capital. Rice farming is the most dominant livelihood pre-occupation in these agricultural communities. Access to social capital is high among the communities. It may seem advantageous as it facilitates resource sharing among households but it is largely internal and manifests low access to external support systems. Productivity is constrained as physical access to markets and financial sources are limited. Given the limits in physical access, majority of the poor cannot access financial capital to support farm operations. While the natural capital is fairly abundant, human capital is not enough to optimally utilize the natural capital. Sustainability rating for most of the barangays is fair, indicating that the current production systems are vulnerable to shocks and stresses. Among the barangays, Ponso demonstrated the highest sustainability rating due to a relatively higher level of productivity and social enterprise support. Libtong, on the other hand, had the lowest sustainability rating. In general, the study revealed that productive capacities as manifested by access to livelihood assets are directly related to sustainability. Sustainability patterns may exhibit a stable trend when accesses to livelihood assets are ensured.*

**Keywords** – productivity, livelihood analysis, sustainability

## I. INTRODUCTION

Based on studies, the present socio-economic status of people in rural areas is on the brink of alarm. Such scenario is indeed an opportunity for intervention at the community level so as to alleviate people from such fate, empower them and become self-sufficient. Capability building activities on resource mobilization and management and alternative livelihood opportunities must be provided to improve the quality of life of the people and forge strong and sustain partnership among them and with other service providers and stakeholders for better collaboration towards development.

The Organic Agriculture-Based Social Enterprise (OABSE) Project is envisioned as a major opportunity at attaining Intervida's (a partner NGO) objective of providing alternative and sustainable means of reducing malnutrition among children and improving the productive capacities of households and communities. This is also in response to the challenge of attaining MDG commitments relative to food security, environmental integrity and education. Given such strategic directions, it is then essential to understand the project beneficiaries' productive capacities in the context of organic agriculture systems. This would form the basic foundation for planning, implementation and future evaluation of the OABSE as one of the centrepiece programs of Intervida in support to the Philippine government.

Agricultural production systems are complex systems (Conway, 1989). Its behavior and performance as a natural resource system is influenced by varied elements within the environment. To understand such complex interactions of the natural resource system, a holistic and integrated process of defining the agroecological components of the system and their interplay should be provided. Often, these interactions define its performance as a productive system.

Productive capacity should then be assessed in terms of access to livelihood assets and how are these assets managed to be available in current terms and in the future. The current performance of these production systems or the assessment of its productive capacity are considered as key points for understanding and for decision-making towards setting a platform for a strategic transition to an alternative production system such as organic agriculture.

## II. OBJECTIVES OF THE STUDY

This study is aimed to assess the productive capacity of the proposed Organic Agriculture-Based Social Enterprise (OABSE) program areas and generate livelihood management options thereof. Specifically, the study aimed to describe and understand the productive capital of each OABSE project area as a socio-ecological system; assess the livelihood assets and capacities in terms of productive resource base, resource use and livelihood patterns, including vulnerabilities in the OABSE sites; provide management and planning guidelines in the transition of farms from traditional to sustainable agriculture following organic agriculture technologies; and identify innovation entry points and research and extension needs of the community for building sustainable livelihoods and resilient communities.

## III. MATERIALS AND METHODS

The project's conceptual model revolves on the idea that agricultural production areas are socio-ecological system (SES). An SES is a system of people and nature

or a “coupled human-environment system” (Young, et al 2005), interacting distinctly and interdependently, creating a unique behaviour or performance of the resource system (Carpenter, 2011). Simply, an SES consists of a bio-physical unit and its associated social actors and institutions, and delimited by spatial or functional boundaries surrounding the ecosystem.

Given the project objectives, the methodological approach is anchored on two resource use assessment frameworks. The first, is the agro-ecosystems framework (Conway, 1989; Marten, 1987) which considers agricultural production areas as a bounded natural resource system modified by man for productive purposes and its behaviour and performance as a system is assessed in terms of the system' properties (productivity stability, sustainability, equitability and autonomy). The second is sustainable livelihood system “comprising of capabilities, assets (including both material and social resources) and activities required for a living” (Chambers & Conway, 1992) and this livelihood system experiences shocks and stresses as it interacts with various factors in the resource system (refer to Figure 1).

Participatory Rural/Rapid Appraisal (PRA) provides a flexible support tool to gather data and consolidate data in a participatory manner. In fact, PRA aggregates and consolidates the data elements of both analytical tools into one cohesive data set while maintaining its distinct analytical context and validity. Likewise, its adoption as a support tool shall enhance early appreciation and acceptance of proposed project initiatives.

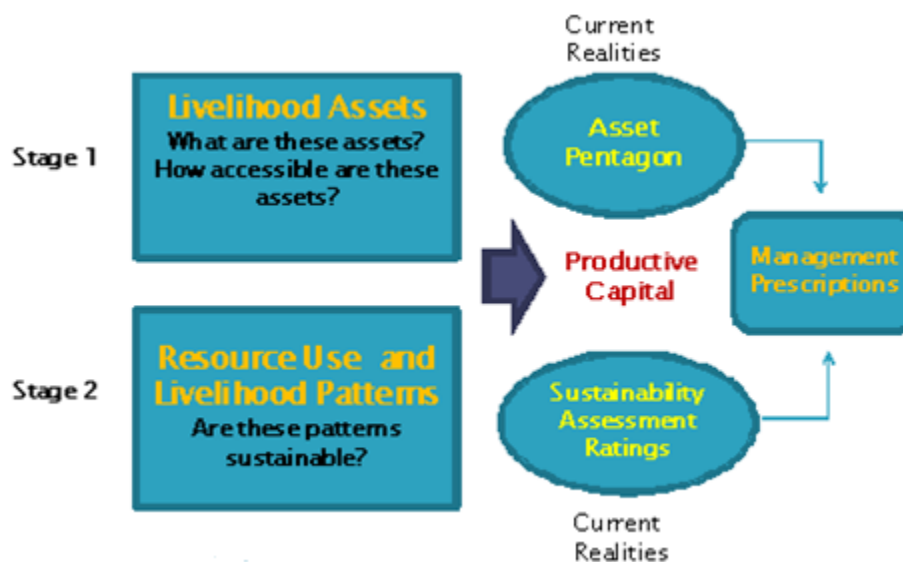


Figure 1. Methodological Framework

#### IV. RESULTS AND DISCUSSIONS

**Livelihood Asset & Pentagon.** Libon cluster is generally a rice farming community where farmers depend on inorganic fertilizers as their way of increasing productivity. People in these barangays had good relationship with their communities primarily because of large kinship and commonality in farming activities. Though social access can be seen as an advantage in resource sharing, this is also a manifestation of low job opportunities and poor economic activities within the area. Majority of the people characterized themselves as poor with more or less P3,000 household monthly income. According to them, they could not fully access financial capital because they could not afford the borrowing rates

provided by the microfinance institutions. Thus, this inaccessibility became a reason of low human and physical capital. While Albay is considered politically strong in promoting education in the entire province, schooling can only be easily accessed up to secondary level. Parents find it hard to send their children to college because of the rising tuition fees and transportation costs. On the other hand, the individual physical capital becomes inaccessible due to the underutilized natural capital. Many farms are not fully maximized. Farmers are more concerned with land sustainability than land ownership issue. Table 1 shows the productive capital of Libon cluster.

Table 1. Productive capital of Libon, Albay

Libon Cluster	Ponso	Sagrada Familia	Villa Petrona	Nogpo	Libtong
a. natural capital	0.713	0.488	0.5375	0.47	0.44
b. social capital	1	1	0.9	1	1
c. financial capital	0.232	0.68	0.0625	0.23	0.032
d. human capital	0.544	0.471	0.467	0.62	0.5
e. physical capital	0.689	0.586	0.54	0.48	0.092

**Vulnerabilities.** For lowland areas such as Ponso, Sagrada Familia, Villa Petrona and Nogpo, flood and crop pests have become their major shocks which largely affect their main livelihood such as rice and sweet potato production. For an upland community like Libtong, the people are vulnerable to coconut pests and soil erosion. With farming as their major source of

income, typhoon serves as their risk factor in attaining a higher level of productivity. The community people revealed that strong typhoons occur only thrice a year but they believe that they have become resilient through times. The table 2 below shows the vulnerabilities and asset pentagon of selected barangays of Libon, Albay.

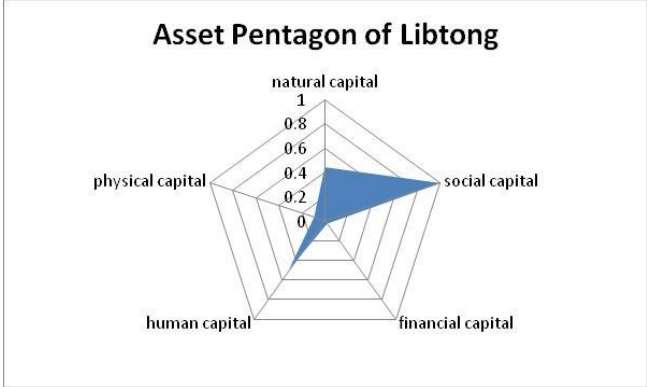
Table 2. Vulnerabilities and asset pentagon of Libon Cluster

Major Livelihood & Vulnerabilities	Pentagon
<p>Ponso (Rice)</p> <p>Ponso's climate-induced risks include typhoons and floods affecting the village's livelihood. Pests and diseases like snails birds, black bug, stem borer and tungro attack more frequently than before. Market price of rice during wet season is low and greatly affects the income of farmers. Shifting values among young people such as decreasing interest to work in the fields may greatly affect the village's existing livelihood. Increasing population will also lead to land conversion causing decline in agricultural lands and increase in residential area.</p>	<p><b>Asset Pentagon of Ponso</b></p>

Table 2 (cont). Vulnerabilities and asset pentagon of Libon Cluster

Major Livelihood & Vulnerabilities	Pentagon												
<p><b>Sagrada Familia (Rice)</b></p> <p>Sagrada Familia's exposure to climate-induced risks like typhoons and floods would primarily affect the village's livelihood. Pests and disease incidence has been more frequent and new species are attacking their fields. Their yield depends on the season, the highest they can get is 80 cavans per hectare in April and the lowest is 30 cavans every January and September. Increasing population will lead to continuous land conversion causing decline in agricultural lands and increase in residential area. With an employment rate of 10% and the shift of young people's preference to work in Manila for better opportunities will decrease the rate of people working in the farm. However, recovery period seems fast and fleeting for the people. In fact, typhoons are calendared in their cropping plans and are prepared of the risks it may cause to their farms.</p>	<p style="text-align: center;"><b>Asset Pentagon of Sagrada Familia</b></p> <table border="1"> <caption>Asset Pentagon Data for Sagrada Familia</caption> <thead> <tr> <th>Capital Type</th> <th>Score</th> </tr> </thead> <tbody> <tr> <td>natural capital</td> <td>0.4</td> </tr> <tr> <td>physical capital</td> <td>0.4</td> </tr> <tr> <td>human capital</td> <td>0.4</td> </tr> <tr> <td>financial capital</td> <td>0.4</td> </tr> <tr> <td>social capital</td> <td>0.4</td> </tr> </tbody> </table>	Capital Type	Score	natural capital	0.4	physical capital	0.4	human capital	0.4	financial capital	0.4	social capital	0.4
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<p><b>Villa Petrona (Sweet Potato)</b></p> <p>Villa Petrona is exposed to various risks and hazards, first with land use, the continuous increase in population will cause an increase in land conversion from agricultural lands to residential areas. People have observed that the fertility of their land has decreased due to acidity. The kind of crops they can produce is limited so they must settle with their livestock and poultry resources. The village is beginning to experience incidence of pests and diseases like rats, tungro, and worms. On the climatic side, the typhoon season is 4 months, this causes them to work harder during the dry season. Poverty level may increase given the fact that people are not able to save money due to expenses affected by inflation.</p>	<p style="text-align: center;"><b>Asset Pentagon of Villa Petrona</b></p> <table border="1"> <caption>Asset Pentagon Data for Villa Petrona</caption> <thead> <tr> <th>Capital Type</th> <th>Score</th> </tr> </thead> <tbody> <tr> <td>natural capital</td> <td>0.2</td> </tr> <tr> <td>physical capital</td> <td>0.2</td> </tr> <tr> <td>human capital</td> <td>0.2</td> </tr> <tr> <td>financial capital</td> <td>0.2</td> </tr> <tr> <td>social capital</td> <td>0.4</td> </tr> </tbody> </table>	Capital Type	Score	natural capital	0.2	physical capital	0.2	human capital	0.2	financial capital	0.2	social capital	0.4
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<p><b>Nogpo (Rice)</b></p> <p>Climate-induced risks include typhoons and floods especially occurring the wet season months of September to December. The high level of climate risk is due to higher level of water during floods. The presence of the Lake also poses a problem during heavy rains due to the shallow waters resulting from accumulation of waste materials from fish cages. This makes the area near the lake highly vulnerable risk to climate induced risk aside from extremes of hot and cold weather.</p> <p>The occurrence of pests and diseases are more frequent than before with bugs, rats, tungro and stem borers, thereby result to lower yield and quality of rice produced. Market price is dictated by the prevailing price in the market at Php12.00/kilogram. However, this price can still be lowered especially during wet season.</p>	<p style="text-align: center;"><b>Asset Pentagon of Nogpo</b></p> <table border="1"> <caption>Asset Pentagon Data for Nogpo</caption> <thead> <tr> <th>Capital Type</th> <th>Score</th> </tr> </thead> <tbody> <tr> <td>natural capital</td> <td>0.2</td> </tr> <tr> <td>physical capital</td> <td>0.2</td> </tr> <tr> <td>human capital</td> <td>0.2</td> </tr> <tr> <td>financial capital</td> <td>0.2</td> </tr> <tr> <td>social capital</td> <td>0.4</td> </tr> </tbody> </table>	Capital Type	Score	natural capital	0.2	physical capital	0.2	human capital	0.2	financial capital	0.2	social capital	0.4
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Table 2 (cont). Vulnerabilities and asset pentagon of Libon Cluster

Major Livelihood & Vulnerabilities	Pentagon
<p>Libtong (Coconut)</p> <p>Normally, climate-related hazards including typhoons, floods and soil erosion due to heavy rains affect the village's livelihood. Pests and diseases like snails, black bug, stem borers, and '<i>cadang-cadang</i>' become prevalent than before. Market price fluctuation or as determined by big <i>compradas</i> greatly affects the income of farmers. Conversion of coconut plantation in hilly and semi flat areas to residential areas due to population increase resulted to decrease in agricultural crop production areas. Some areas were cleared for <i>kaingin</i> that induced soil erosion. Lack of interest to farm work among younger generation likewise affect agricultural productivity. Prolonged absence of established irrigation system in the farm production areas will continuously affect yield and livelihood of the farmers. The issue on land tenure and tenant system likewise was identified as contributing factor to lack of interest in improving or diversifying farm production.</p>	

**Sustainability Assessment.** Among the five barangays, Ponso demonstrates the highest sustainability rating due to a relatively higher level of productivity and social enterprise support from its local community. But its people believe that there is much more to gain from their rice farming. The other barangays' management of farms is deemed inefficient due to the high cost of production incurred yet lesser yield compared to Ponso.

Except for Libtong, all other barangays are well supported with common livelihood facilities such as transportation and communication services, hence, making it easy for them to access market and pose opportunities for other livelihood. With poor roads and weak infrastructure support, Libtong became an economically depressed community with the lowest sustainability rating. Table 3 shows the sustainability ratings of the selected barangays of Libon, Albay.

Table 3. Sustainability ratings of selected areas of Libon, Albay, Philippines

Sustainability Theme/Indicator	Ponso	Sagrada Familia	Villa Petrona	Nogpo	Libtong
<b>1. Sustainable management of natural resources (40%)</b>					
Usage of organic input (10%)	3	2	2	2	2
Cropping diversity (10%)	4	2	2	3	2
Livelihood mix (10%)	4	3	2	3	2
Agricultural production (10%)	4	2	3	3	2
<b>2. Community resiliency (30%)</b>					
Degree of exposure to climate related risks (10%)	1	1	2	2	2
Incidence of crop failure (10%)	2	2	1	1	2
Usage of inorganic inputs (10%)	1	2	2	2	1
<b>3. Social enterprise development (30%)</b>					
Access to buyers (4.2857%)	4	3	3	2	3
Access to technological and technical support (4.285)	3	1	2	3	1
Access to financial capital (4.2857%)	4	2	2	2	1
Access to transport 4.28575%)	4	4	4	2	2
Access to land for cultivation (4.285%)	3	2	2	3	2
Presence of local support institutions to facilitate access to livelihood assets (4.285%)	4	4	2	2	3
Role of Women in enterprise development (4.2857%)	2	3	2	2	2
	<b>2.9284/MS</b>	<b>2.21415/FS</b>	<b>2.12845/FS</b>	<b>2.2856/FS</b>	<b>1.8999/FS</b>

1.00 - 1.74: Not Sustainable (NS); 1.75 - 2.49: Fairly Sustainable (FS); 2.50 - 3.24: Moderately Sustainable (MS); 3.25 - 4.00: Highly Sustainable (HS)

## V. CONCLUSIONS AND RECOMMENDATIONS

**Challenges.** There are two issues that farmers wish to address in their respective farming communities: productivity and profitability amidst climate change. At present, they still do not have a clear understanding of “sustainability” in their farms. They equate productivity with sustainability. Yet what is good about these farmers is their willingness to learn, unlearn and relearn the gray areas in farming or better yet, the alternative way of farming. Rice, sweet potato and coconut are crops that are not only promising for future developments but are basic commodities which do not require extensive marketing effort, hence, making their main livelihood an advantage in developing the “better way” of farming.

**Options.** Development options will revolve on where they seem to be weak in their asset pentagons. These are the financial and human capitals. The microfinancing project will address their financial requirements to start the transformation while the capability building, study tour and value-adding projects will answer their problem on competence gaps. Strategies under the ‘climat-smart agriculture’ will try to reduce the risks of climate change and create a resilient community in times of calamities. As summary, the table 4 below shows the management options recommended to be observed in the OABSE project areas.

Table 4. Summary of the Development Options for OABSE areas

	<b>Issues</b>	<b>Options</b>
<b>Ponso</b>	-increasing incidence of pests and diseases, deteriorating soil fertility, erosion and flooding hazards brought by climatic factors, and increasing land conversion from agricultural to residential area - lack of livelihood opportunities, increasing number of unemployed individuals, high input costs particularly inorganic fertilizer, and lack of capital	<ul style="list-style-type: none"> <li>– Local Study Tour</li> <li>– Farmer’s Capability Building on Organic Agriculture</li> <li>– Organic Agriculture Microfinancing Project</li> <li>– Organic Palayamanan Concept</li> <li>– Climate Smart Agriculture</li> </ul>
<b>S. Familia</b>	floods and erosion, decreasing soil fertility, increasing incidence of pests and diseases, and increasing land conversion from agricultural to residential area - lack of livelihood opportunities, increasing number of unemployed individuals, accumulation of debts, high production costs particularly inorganic fertilizer, and lack of capital	<ul style="list-style-type: none"> <li>– Local Study Tour</li> <li>– Farmer’s Capability Building on Organic Agriculture</li> <li>– Organic Agriculture Microfinancing Project</li> <li>– People’s Organization Development</li> <li>– Enhancement of Barangay Sufficiency Economy</li> </ul>
<b>V. Petrona</b>	-floods and droughts, increasing land conversion from agricultural to residential area, pests and diseases, low soil fertility - losses caused by low price of produce, people tend to accumulate debts, absence of source of seeds and fertilizers, and lack of capital.	<ul style="list-style-type: none"> <li>– Local Study Tour</li> <li>– Production of Organic Sweet Potato</li> <li>– Organic Agriculture Microfinancing Project</li> <li>– Commodity Value-Addition</li> <li>– Climate Smart Agriculture</li> </ul>
<b>Nogpo</b>	-shallow level of the lake which leads to flooding during heavy rains and strong typhoons, low fish catch due to the presence of big time fish cage operators, availability of potable drinking water and increasing land conversion from agricultural to residential area due to increasing population. - lack of irrigation facilities, palay drier and farm machineries, lack of livelihood opportunities, high cost of farm inputs, non availability of organic inputs, no established market for organic products and lack of soft loans for financing every cropping season.	<ul style="list-style-type: none"> <li>– Local Study Tour</li> <li>– Farmers Capability Building on Organic Agriculture</li> <li>– Organic Agriculture Microfinancing Project</li> <li>– Mitigating Climate Induced Risks</li> </ul>

Table 4 (cont). Summary of the Development Options for OABSE areas

	Issues	Options
<b>Libtong</b>	<p>-Flooding, soil erosion, increasing incidence of pests and diseases specifically <i>cadang-cadang</i> and the rapid yellowing of coconut leaves, absence of irrigation system and increasing land conversion from agricultural to residential area.</p> <p>-lack of livelihood opportunities, lack of technical and technological support to increase agricultural productivity, increasing number of unemployed individuals, high input cost particularly inorganic fertilizer and dependence on the same, lack of quality seeds and farm inputs/machineries and lack of capital.</p>	<ul style="list-style-type: none"> <li>- Local Study Tour</li> <li>- Farmer's Capability Building on Organic Agriculture</li> <li>- Mitigating Climate Induced-Related Problems in the Practice of OA</li> <li>- Organic Agriculture Micro Financing Project</li> </ul>

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