Training Module: Farm Appraisal and Planning for Organic Farm Development
TABLE OF CONTENTS

Introduction
How to Use this Module

Module 1: Understanding the Farm Ecosystem
  What is an Ecosystem?
  The Farm as an Ecosystem
  Process of Understanding the Farm Ecosystem

Module 2: Farm Appraisal and Data Gathering Tools
  Participatory Data Gathering Tools and Techniques
  Participatory Rural Appraisal Tools
  Data Organization and Consolidation

Module 3: Analysis Process
  SWOT Analysis
  Why SWOT Analysis?
  Why Trending?

Module 4: Farm Planning and Budgeting
  Elements of Planning

References
INTRODUCTION

The lives of the millions of the small-holding farmers in the Philippines are challenged by a multitude of perennial problems (low harvest, barren soils, plant diseases caused by agro-chemical inputs, expensive inputs), now topped by the effects of climate change.

To face these challenges, the farmers need to systematically study every condition of the farm, and plan according to the findings and conclusions.

Sustainable Agriculture is a means to do this with the perspective of agroecology, productivity for the farmer, and sustainability. Appraising and planning for the design of one’s farm is also a firm exercise of the farmer’s right to choose and develop.

Farm appraisal and planning within the framework of Sustainable Agriculture entails or requires the tapping of traditional wisdom and indigenous knowledge in agriculture, and appropriate technology. This will also require tapping into the cooperative spirit of the community – sharing of knowledge and resources.

This Module provides a reference for the farmer and the community to systematically conduct farm appraisal and planning with the framework of Sustainable Agriculture.

- Further enhance farmers’ capacity in managing their farms;
- Share basic principles and simple tools in the appraisal and analysis of their farm ecosystem’s situation;
- Share basic principles and simple tools in planning;
- Promote documentation to aid in further honing of skills and as basis for further improvement and sharing of experiences;
- Increase production capacity of the farm for added income; and
- Increase farm diversity and integration, to create a functional diversified and integrated farm ecosystem.
How to use this manual

This manual has been designed specifically to facilitate in the conduct of farm appraisal and planning.

This contains introductions to principles, guides in the conduct of appraisal and planning and tools and how to use them for data gathering, analysis and planning and blank sheets to document the actual appraisal and planning the user/farmer will do in his farm. This also serves as a documentation notebook to help in the assessment and re-planning of the farm in the future.

The documentation will also serve as the tool of the farmer to share his views, learnings, experiences and innovations to other farmers and to strengthen his capacity in the management of his farm.
MODULE 1: UNDERSTANDING THE FARM ECOSYSTEM

To understand fully a farm ecosystem is to acknowledge first the notion of a system and its various inter-playing factors; and to examine or analyze critically these different factors that make up the system itself.

This module provides a general view of the need to understand the different ecological factors and parameters that affect farm production. Specifically, it expects the user to able to define and used some of the key concepts, principles and parameters in understanding the farm ecosystem in the farm planning process.

Suggested methodologies

- Visual presentations
- Games --- puzzle, spider web
- Workshop --- meta-cards, drawing

Materials needed

- Visual aids
- Colored pens and marker pens
- Manila paper
- Meta cards
- Masking tape
- Cotton twine
- Pictures of farm components
- Puzzle of a system --- “farm truck”
- Handouts
What is an ecosystem?

A "system" is one that has interdependent components acting or performing as one and/or is serving a purpose.

An ecosystem therefore is a collection of interdependent components of both living/biophysical (flora and fauna) and non-living/physical things in a given space serving a certain purpose.

An ecosystem exhibits the following characteristics:

1. **Hierarchical.** Every planning area is encompassed in larger ecosystems and encompasses smaller ecosystems;

2. **Complex.** The living and non-living components of ecosystems are interconnected and interdependent;

3. **Dynamic.** Temporal changes occur in ecosystems structure and function;

4. **Performs critical life-support functions;**

5. **Humans are integral part of it;** and

6. **Knowledge of Ecosystems is incomplete.**

---

**Ecosystems are hierarchical. Every planning area is encompassed in larger ecosystems and encompasses smaller ecosystems.**

The concept of “ecosystem” is human construct, which is used to describe and model the interactions between living organisms and their non-living environment in a specified geographic area. This means that ecosystem boundaries can be drawn where appropriate for planning or other purposes, as long as inputs and outputs to the system are considered. Ecosystem boundaries may not match administrative boundaries.

Planning areas, such as the farm, can be considered as ecosystems. These ecosystems are embedded in larger ecosystems and in turn have smaller ecosystems embedded within them. Ecosystems are linked to each other by the functions they perform.

---

**Ecosystems are complex. The living and non-living components of ecosystems are interconnected and interdependent**

---
Organisms are linked to each other and to their environment through complex cycles of nutrients, oxygen, energy, water and other necessities of life. Maintaining the interconnections between the living and non-living components of an ecosystem is vital to maintaining its structural and functional integrity.

Because of the interdependency of ecosystem components and the interlinking of ecosystems at various scales, a single change of sufficient intensity can affect an entire ecosystem and the effects can be transferred to other ecosystems.

Ecosystems are dynamic. Temporal changes occur in ecosystems structure and function

Ecosystems are not static. The structure (e.g., species composition) and function (e.g., nutrient cycling) of ecosystems change naturally over time in response to climatic, geologic, biologic and other changes associated with the aging of the earth. In turn, these changes effect other changes in the ecosystem.

Ecosystems have inherent capacity to respond to changes without being drastically altered themselves. When the capacity of a given ecosystem exceeds its capability to absorb changes, a new and different ecosystem may replace it.

When one component of the ecosystem is changed, the future conditions of the ecosystem likely will also be changed. The magnitude of any change in an ecosystem will determine how much the future of the ecosystem will be affected.

Ecosystems perform critical life-support functions

Human life is dependent on ecosystems. Natural resources, such as food and fiber, as well as other components necessary for life are produced by ecosystems. In addition, ecosystems are the reservoir of many present and future medicinal and derivative products, as well as spiritual, aesthetic and restorative environments for the human spirit. Human interests are well served when the ecosystem’s long-term sustainability is assured.

Natural and managed ecosystems (agro-ecosystem or farm ecosystem) are sustained by basically similar functions related to productivity, energy flow, and nutrient cycling. All of these functions are essential for supporting life.
Humans are integral part of ecosystems

“Man is part of nature and his war against nature is inevitably a war against himself” --- Rachel Carson

Human values and activities influence the structure and functions of ecosystems. Human actions are a key component because of direct and indirect impacts, adverse and beneficial, resulting from those human activities.

When problems arise in an ecosystem, they are usually expressed as human values. In achieving a desired ecosystem condition, human values determine scope and extent of problems and the associated corrective actions to be taken.

Ecosystems must be sustained for the long-term well-being of humans and other forms of life. Human land use and management decisions determine the quality, health and sustainability of ecosystems. Knowledgeable, well-informed decision makers are essential for a sustainable agriculture and natural resource use.

Knowledge of Ecosystems is incomplete

The relationships between living organisms and their environment are part of an ecosystem’s complexity is still not fully understood. While our knowledge of the natural world grows daily, some important relationships regarding the effects of management activities on resources and ecosystem functions is unknown. Although our knowledge is incomplete, we still provide assistance based upon the best available knowledge derived from cooperative efforts, data collection, analysis and dissemination among various agencies and groups.

To understand ecosystem complexity, scientific data and technical tools are used to help evaluate impacts upon ecosystem components and processes. In many instances individual effects to the ecosystem cannot be directly determined, therefore ecosystem health indicators are used to describe effects.

The farm as an ecosystem

The farm as an ecosystem is a collection of human, plants, animals, water, land, air, microorganisms, insects, minerals, temperature, etc. that is interdependent and serves as the production site for food and income for the farmer and his family.
Interdependency can be illustrated in the marvelous harmony between plants and animals that accounts for the sustenance of living things. For instance, the soil which is formed though thousand years of elemental processes could conveniently stand alone by itself. But whenever a crop is grown, the soil comes into a dynamic relation with another living form in the environment. As the crop grows, other living forms also share the benefit from the relationship.

Humans, birds, animals and insects eat the fruits and some other parts of the plant. Sunshine and water nourish plant growth. Animal waste and plant decay – once decomposed, are absorbed by the soil. These restores back the nutrients that the soil gives to plants as food.

There are other things however that have a substantial effect on animal and crop relationship. But just the same, we have observed that this orderly interplay of trees, soil, plants and animals (also repeated in seasonal cycles) follows a pattern or one characteristic of a system. It can maintain the pattern of its orderly execution of activities.

We can better understand farming system if we likewise think of the other factors or determinants dealing with farm cultivation. This means that we do not examine only the technological aspects of production as its only factor. We also have to look at the socio-economic factors, environmental components and most especially, the farmer’s condition and his role in the production process.

When a farmer begins to think of the effects of lack of water, inadequate production capital, or low crop yield and the possible loss of income, he is in the process of examining already the many factors related to his production system.

These determining factors are by themselves separate categories of things or issues that ultimately define the kind of farming system a farmer would adopt. Impact of these factors would also define the outcome of the socio-economic condition of the farmer.

Looking closely at these factors, we see that each single component plays a strategic role and they are closely interrelated, making up the whole system of production. To illustrate:

- Water is a biophysical resource that is essential for plants to grow well.
- Income is an economic parameter that tells whether the farmer earns enough or not.
- Inadequate capital to plant is also an economic factor that affects the capability of the farmers to initiate production.
- The lack of potential planting materials (seeds) is a direct concern of the essential required resource (seeds) to enable the farmer to sustain cultivation.
**Why the need to understand this system and the factors around farm production?**

There’s a saying that one cannot give, what one does not have. This simply points out what we need to know or that we must be in possession of some knowledge before we can do anything. Hence, if we are to do some improvement in our farming system, we must first learn or have some understanding of the various factors affecting production.

Through this process, a farmer would be enabled to come to a well-informed decision. He would know some feasible and viable options for his farm. For problems identified, he could come up with solutions and proportionate plans of action in short term and long terms. Also, he could come up with a production plan that would bring about high productivity. Achieving this, would eventually bring other expected effects of increase in income, adequate food supply, provision for the needs of children, clothing and/or shelter; and contribute to the needs of the community and country in general.

**Process of Understanding the Farm Ecosystem**

*Understanding Farm Ecosystem as Part of Farm Planning and Management Cycle*

The process of understanding the farm ecosystem is just one part of various phases of developing an efficient farming system. This is because it does not end in understanding the farm ecosystem unless a process of making new “farm plans” or designs with clear objectives and targets are accomplished. Again, to remain as farm plans or designs would also not be complete unless what was planned out or designed is implemented in the field to attain the desired objectives and targets.

Implementation of a new farm plan as a concrete action is already a good step in itself because it has already put into actual what was only perceived and planned out earlier. However, the process does not end here. There will be corresponding processes again to complement and improve implementation such as monitoring and evaluating the performance of the newly implemented farming system.

Through this, the farmer would be able to adjust, re-plan, modify, or eliminate certain actions that do not contribute to the achievement of his desired objectives and targets. So, one will have to go back again to the first step done earlier. And this involves understanding again the farm ecosystem so that one can form a new plan and design suitable to the changes and development found in his/her farming system. Thus, the cycle begins all over as illustrated on the next page.
Identifying the Factors in a Farm Ecosystem

In particular, there are three (3) categories that could serve as basic references in determining the various factors of a rice ecosystem, namely: (1) the farm or field; (2) the community; and (3) the farming household. Although there could be other source categories, these three are considered primarily for their close and direct relations to the farming system.

The Farm

At the heart of a farming system is the farm itself. There are thousands of hectarage devoted to food production all over the world. In fact, the security of our food supply depends largely on the yield that could be produced by every hectare of farms available. Hence, identifying and analyzing the different factors surrounding the farm itself is a major step in understanding the farm ecosystem.

In this area, factors to be considered could include an analysis of the plant varieties planted, to see which variety is most resistant to pests, adopts well with the soil; and has sufficient produce. Looking at the common rice pests present, their population and incidence of attack provide an understanding of the types of pests, and the potential damage they could do to the crop. Studying their life cycles and habits, opens strategies to alternative pest control and management. Soil conditions in the farm could indicate nutrient deficiencies or fertility requirements needed by the type of crop planted. Water sources and utilization particularly for irrigated lowland conditions could provide an idea of how many croppings a farmer could do.

The environmental condition surrounding the farm area also helps us locate other potential resources like pesticidal plants that could control pests naturally. Another important factor is to review the history of the climatological pattern of the area, the cultivation system from generation to generation, the yield output over the years and many more. A separate list of the many factors that could be examined within the farm is highlighted in Table 1. Though not exhaustive, at least it presents the essential factors to consider in the farm ecosystem. It also indicates why these factors and determinants are important in examining the farm ecosystem. Farmers could add more to the list based on what they see as important by their experiences.

The Farming Household

The cultivator and his family are equally at the center of the whole farm ecosystem. It is for the simple reason that the farming household directly works on land - from land preparation, transplanting and ultimately, harvesting the produce. Family labor in production is too significant to ignore especially the indigenous knowledge they have gained starting from their forebears and years of farming experience.
Foremost among the factors considered, is to look at farming households' priorities in production as these provide an idea how production would look like. Knowing their landholding status will inform us how much he/she could make decisions in his/her cultivation system. For instance, if he/she is only a tenant; and his/her landlord alone decides his/her cropping pattern along with the number of times he could plant, could establish a limiting factor or hindrance to his/her capacity to make his/her own cropping innovations. Being aware of this would help the farmer identify solutions to this problem. Their income, family expenditures and liabilities could determine their capacity or limitation to address production concerns of capital.

Again, just like the farm, there are other essential factors that could still be included.

The Community

The immediate environment where the farm is located pertains to the community area at the local farm level. The type of socio-economic and political factors prevailing in the community would have an impact to the farm production system even if indirectly. Again, knowing what these factors are is important if we need to have a firmer grasp of its effects in local farming systems.

Among these factors are the local agricultural policies. If the local governance promulgates chemical intensive farming, it gives an indication that farmers might not get support if they choose to cultivate non-chemical production processes. Another would be the demand factor of produce as it would give a picture of how much of the produce in the locality are supplied in the community and how much of the volume are distributed outside. It’s also important to examine the different enabling support found in the community that enhances the capacity of farmers in the production process. Among these could be post-harvest production facilities like dryers and milling stations, farm to market roads, buying stations for surplus produce, agricultural agencies that could provide technical assistance and facilities, etc.

These factors among others, greatly affect the whole production system. Whether it is a positive effect or negative varies from one locality the other.
TABLE 1: Factors and Determinants of the Farm Ecosystem

<table>
<thead>
<tr>
<th>FACTORS/DETERMINANTS</th>
<th>PURPOSE</th>
<th>HOW TO GET DATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Field Level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. The Plant</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Variety/seed types</td>
<td>Knowing the type of variety planted and its inherent characteristics helps the farmer decide what appropriate cropping pattern, varietal improvement, and propagation methods to use. Prior knowledge helps farmers understand the causes of problems associated with low pest resistance, low yield and instability of the crop.</td>
<td>• A thorough examination of the crop at its different growth stages through field monitoring and evaluation. • Interview with farmers. • Through review of secondary information from other farmers or available reading materials from NGOs.</td>
</tr>
<tr>
<td>• Maturity period</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Yield</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Growth stages</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Leaf production</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Root development</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Tillers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Panicle formation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B. Biophysical Traits</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Topography</td>
<td>Knowing the different biophysical traits in the environment helps farmers understand the relationship of plant growth and conditions of the soil, sunlight, topography of the field in terms of yield performance, resistance to pest, typhoon and drought. Having known rainfall patterns and temperature, could help farmers decide the timing of planting to avoid risk of crop loss or damage. Identifying available trees and vegetation provides farmers with options to utilize whatever available resource to improve soil fertility and provide necessary plant nutrients.</td>
<td>• Secondary barangay data • Maps • Time lines • Sampling of soil analysis • Transect walk • Interviews with farmers • Seasonality graphs for climate and rainfall patterns • Matrix ranking for seed/variety preferences both for livestock and animals • Farm lay-out detailing crops and irrigation patterns</td>
</tr>
<tr>
<td>• Elevation altitude</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Soil conditions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Sunlight availability and duration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Water availability/irrigation patterns</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Rainfall patterns and area temperature</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Drought periods</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Typhoon occurrence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Wind velocity and directions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Vegetation cover (trees, shrubs, bushes)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Erosion status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Availability of seeds/planting materials and animals</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### C. Pest and Diseases
- Types of pests & population
- Types of friendly insects & population
- Incidence of pest attacks and occurrence
- Weed types and density

- To determine alternative appropriate pest management strategies.
- To enable farmers to select pest resistance varieties and other farming methods to lower the risk of crop damage.
- Field pest and weed count through sampling
- Field monitoring of incidence of pest attack

### D. Farming System
1. Farm lay-out per cropping season
2. Cropping calendar
   - Crop rotation
   - Relay cropping
   - Sequential cropping
   - Diversification
3. Cultural practices
   - Land preparation
     - time of clearing, plowing
   - Seeds and seedling preparation
     - seed source
     - seed selection & storage
     - transplanting
   - Planting system
     - time of planting
     - plant spacing and orientation
   - Pest management
     - pest management practices (mechanical, biological, chemical)
     - weed control management
     - disease control measures
   - Soil fertility practices
     - methods of

- Understanding the farming system adopted could help farmers in:
  - deciding for changes in land preparations patterns;
  - selection of adaptable seeds and varieties;
  - Modify crop rotation, diversification techniques;
  - Adjusting land preparation and clearing periods based on climate patterns;
  - Strengthening positive cultural traits in production & improve limiting practices;
  - Improving post-harvest seed preservation/storage;
  - Designing plant spacing and orientation;
  - Finding out practices that do not help improve soil fertility and adopt corrective measures to remedy the situation;
  - Improving the utilization of appropriate irrigation facilities if these are available; likewise to establish one if there are existing available water sources;
  - Adopting alternative pest management measures through biological,
| Fertilizing (when and how) | Chemical and mechanical means rather than through the use of chemicals and pesticides;  
| Irrigation practices  
- methods of irrigation (when and how) |  
| Harvesting practices  
- period of harvesting and how (method)  
- harvesting equipment and implements  
- what is done with post-harvest waste |  
| Post harvest practices and processing  
- what was done with produce?  
- Any storage practices? |  
| Livestock production  
- types of livestock raised  
- care and management practices  
- breeding system  
- feeds and formulation |  
| Nutrient cycling methods  
- utilization of farm waste to fertilize the soil  
- use of animal manure for fertilizers |  
| Determining livestock manure that could be made available for soil fertilization; and  
- Assessing nutrient recycling methods so that the farmer can improve his existing practice or to adopt the process if he has not applied it yet in the farm. |
II. Farming Household

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>Tenurial status</td>
</tr>
<tr>
<td>B.</td>
<td>Number of household members</td>
</tr>
<tr>
<td>C.</td>
<td>Labor arrangements</td>
</tr>
<tr>
<td>D.</td>
<td>Capital for production expenses</td>
</tr>
<tr>
<td>E.</td>
<td>Family food requirements</td>
</tr>
<tr>
<td>F.</td>
<td>Net farm income for off-farm and farm income</td>
</tr>
<tr>
<td>G.</td>
<td>Farming skills and knowledge</td>
</tr>
<tr>
<td>H.</td>
<td>Access to seeds and technical support</td>
</tr>
<tr>
<td>I.</td>
<td>Expenditures &amp; liabilities</td>
</tr>
<tr>
<td>J.</td>
<td>Farm equipment and facilities available</td>
</tr>
<tr>
<td>K.</td>
<td>Gender-fair labor arrangement and allocations for production and decision-making processes</td>
</tr>
</tbody>
</table>

These factors help farmers:

- Gauge his labor capacity vis-à-vis the requirements of production;
- Assess his capital capacity when there’s a necessary expenditure for production;
- Determine his food needs so that he can design his production system to be responsive to the food needs of the household;
- Determine his/her what knowledge and skills are still needed to improve his production;
- Determine the required farm equipment and implements necessary for production; and
- Identify labor arrangements between husband and wife in terms of production so as to make the necessary adjustments of household labor allocation vis-à-vis production requirements.

- Formal and informal interview
- Pie diagram for income and expenditures
- Bio-clock comparison of male and female daily work activities
- Seasonality graph to illustrate peak period of income and expenditures
- Inventory listing of farm tools and implements
### III. Community Level

<table>
<thead>
<tr>
<th>A. Location and accessibility</th>
<th>To help the farmers:</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Population demography</td>
<td>- Determine the distance of transporting products and potential market areas;</td>
</tr>
<tr>
<td></td>
<td>- Identify the volume of demand of surplus (available market);</td>
</tr>
<tr>
<td>B. Market and credit facilities</td>
<td>- Road systems and transport facilities will give insights on available mode of disposing productions from the field to selling sites;</td>
</tr>
<tr>
<td>C. Post-harvest facilities</td>
<td>- Post-harvest facilities and existing support agencies could give the farmers options to avail of facilities and services needed; and</td>
</tr>
<tr>
<td>D. Transport facilities</td>
<td>- Attitudes and cultural patterns could help determine rice farming practices to be strengthened and improved.</td>
</tr>
<tr>
<td>E. Road systems</td>
<td></td>
</tr>
<tr>
<td>F. Technical agricultural agencies</td>
<td></td>
</tr>
<tr>
<td>G. Cooperatives and other existing organizations</td>
<td></td>
</tr>
<tr>
<td>H. Social services</td>
<td></td>
</tr>
<tr>
<td>I. Community leadership patterns</td>
<td></td>
</tr>
<tr>
<td>J. Existing agricultural program and policies</td>
<td></td>
</tr>
<tr>
<td>K. Prevailing attitudes and beliefs</td>
<td></td>
</tr>
<tr>
<td>L. Peace and order situation</td>
<td></td>
</tr>
<tr>
<td>M. Agricultural product marketing and trading systems</td>
<td></td>
</tr>
<tr>
<td>N. Agricultural labor patterns</td>
<td></td>
</tr>
<tr>
<td>O. Dominant agricultural product</td>
<td></td>
</tr>
</tbody>
</table>

- Spot map
- Demography
- Product flow diagram
- Venn diagram
- Seasonality graph for cropping patterns
- Market survey and informal interview
- Ocular survey
- Focus group discussion
This module presents some vital steps, tools, methodologies and processes that would help farmers examine the various components of his farming practice. In such a way, the resulting information and insights he could gather would help him plan and decide later on the kind of cultivation, farm components and farm practices/technologies that they are going to adopt.

**Participatory Data Gathering Tools and Techniques**

A number of participatory approaches for assessing local farm conditions, problems and opportunities have been developed. The participatory data gathering tools and techniques presented here are simple and farmer-friendly tools. They provide a "basket" of tools and techniques for visualizing, interviewing and group work. Most of these are visually-presented and do not need high technical write ups. Farmers only need to do a little drawing of lines to indicate roads, a few squares to indicate houses, small dotted lines to indicate rainfall etc. These are designed to suit to the needs of the small farmers who are not accustomed to do paper work.

*A basket of participatory assessment tools and techniques for collecting and analyzing information.*

The following are some samples of the tools that could be used to gather the different factors and parameters describing the rice farm ecosystem.
**Participatory Rural Appraisal Tools**

1. **TIME LINE** - It is a chronology or sequence of events that have taken place in a particular community or area. Events may pertain to the general history of the community, or to specific subjects or sectors such as health, education, agriculture, animal husbandry, etc.

   Time line exercise can be applied to complete the background of a village or trace the evolution of specific activities or programs such as health, education, and other social amenities (such as transport, water supplies, etc.), animal husbandry and agricultural programs, or other economic activities.

   Agriculture timeline for example, would indicate the occurrences of droughts, adoption of new crops and varieties, HYVs, fertilizer usage, years in which major crop failures took place and so on.

   Similarly, a time line on animal husbandry would indicate the trends in animal husbandry practices, shifts in the populations of small and large animals, introduction of cross breeds, installation of veterinary infrastructure, major disease epidemics, etc.

2. **VENN DIAGRAMS** - These show relationships of various institutions, organizations, programs or individuals with each other and with the community as perceived by the members. The exercise is carried out with the use of different sizes of circles or paper contents - indicative of the relative importance of a particular institution/individual to the community.

   In general terms, this method could be used to establish the total picture in terms of the community's relationship with different institutions (e.g., banks, cooperatives, market, etc.)

   Specifically, the exercise may be done by asking the villagers to indicate, for example, their perceived ranking of various constituents of each institution or sector.

3. **SEASONALITY DIAGRAMMING** - An extremely important and useful exercise which is used to determine seasonal patterns in rural areas as related to rainfall, farming practices, employment and so on.

   In seasonality, an attempt is made to determine the seasonal calendar as understood and practiced by the community (e.g., festivals, agricultural events, community rituals). This is then adjusted to the English calendar and thus built upon using different lengths of sticks or numbers of stones or seeds to quantify items such as rainfall, employment, etc.
The seasonality exercises have a wide range of applications. It can be used to indicate rainfall, agricultural operations, employment, credit availability, grazing patterns, milk yields, breeding periods, animal and human health, disease patterns, etc.

4. **MATRIX RANKING** - This exercise is done when it is required to compare and study the merits and demerits of a variety of items such as different types of crops, animal breeds, trees, etc. The exercise is done by means of a visual chart with the items on one side (as is) and the criteria for comparing these items on the other side. For example, in the case of crops, the criteria could be gram yield, straw yield, quality, drought resistance, etc. In the case of animals, the criteria could be milk yield, fat percentage, disease resistance, requirement of green fodder, etc.

Once the chart is established, scoring is done, i.e., points can be given for each item by placing seeds or stones. For example, if a crop variety is extremely pest resistant, the farmer may give it a score of 4-5. If it is less, 2-3 points. If the crop is disease susceptible 1-0 point, and so on.

Matrix ranking can be used to study a range of subjects such as trees, fodder, types of cattle and breeds, crops and crop varieties, soil types, etc.

5. **MAPPING**

a. **Social mapping** - This is the construction of a community map using chalk on the ground or a cement floor. Through this exercise an understanding of the village layout, showing the main features such as housing, stores, church, and other infrastructure. Once the base map is established, it is possible to build unto it different types of information (e.g., animal and human census, education and health status, land holding and economic status) for the purpose of planning. For this purpose, different types of seeds can be sued to indicate a specific category or item. For example, in an animal husbandry census, tamarind trees are used to indicate bullocks, castor seeds for cross bred cows, maize seeds for buffaloes, black peas for goats, etc. indicating various animal populations per household.

Similarly, markers of different columns of seeds can be used - given to indicate irrigated rice fields, rain-fed or non-irrigated, upland or lowland, etc.

Social maps can be used to identify different social groups or sectors, animal owners, etc. The exercise can also be done to find out the household wide status of animal or land holding. Animal and human census can also be accomplished using different types of seeds as described.
Mapping can also be used to identify past and future community project beneficiaries, families which have undergone family planning, household educational status, or health patterns.

b. Resource Mapping - This method is used to locate the resources of an area such as forest, watershed, etc. This helps establish the extent and locations of these resources for further analysis. Like social mapping, resource mapping can be done using colored chalk, pens either on the floor, on the plain ground or on paper.

Items such as dry land, irrigated land, grazing land, forest land, and water bodies can be indicated through resource mapping. The same tool can also be used to prepare treatment plans for soil and water conservation, forestry and other treatments.

6. TRANSECTS - The exercise consists of observatory walks through the community and the surrounding area such as fields, hills, forests, grazing lands, etc. This is done with farmers as guides. It helps not only to locate and pinpoint various physical aspects of the community or watershed, but also to understand and examine with the people, the backgrounds of these resources. For example, the cause of deforestation, the use of common land, soil and water management and other indigenous practices.

Transects are used as pre-requisites for mapping. Zoning of different areas in ecological zones, land use mapping, productivity zoning, locating indigenous technologies, etc. can also be done. Transects are also used to locate areas in the community which need to be developed.

7. HISTORICAL TRANSECTS - Indicate the trends that have taken place over a period of time. These show the changes that have taken place in terms of resource use, cropping patterns, livestock, populations, etc. This also entails internal discussions with concerned target groups, which could be a basis for evaluation document. Charts could be kept as records.

Historical transects are useful to understand the changes that have taken place in livestock practices, nutrition, health care and education, customs and social practices, forests, land use and agricultural practices, productivity, populations and demography, etc.

Data Organization and Consolidation

Using the table for the factors and determinants of the ecosystem - too much data could be generated from the field, farm and community levels. To avoid having to deal with too much data that is not needed in the immediate, some considerations could be taken into account.
**Be clear of Objectives**

In understanding the farm ecosystem, it is important for the farmer to be clear on the objectives as to why he needs to gather particular information. If one wants thorough information on the various factors and determinants that characterize a particular rice eco-system, then he may do a comprehensive gathering of all the factors. This way, he may wish to establish baseline information. Or, he may just want to focus on a few but outstanding trends on the rice ecosystem like the massive pest attack and the weak resistance of the rice variety being planted. Hence, the key is to be clear of what type of information one has to gather.

**Validation of Information**

There are two immediate processes where one could cross-check if the information gathered have a proportionate accuracy. For instance, information gathered from secondary sources, which has not been updated maybe validated through confirmation in the field and interviews of farmers in the area. Another is through “triangulation.” As the name connotes, triangulation is weighing the accuracy of information by comparing it from three sources, e.g., interview, secondary sources and direct observation. Whichever has more or less similar data, constitute the majority and hence, becomes the most accurate data available.
Once the data are gathered, we now have in our possession lots of information. But this information would not be too useful unless some processing of the information is done. The following step processes are some of the basic and simple methods that could help farmers proceed with the utilization but especially of analyzing the information.

The process of analyzing information will be helpful for farmers to identify problems in the farm ecosystem and to prioritize solutions or strategies in addressing them. Farm analysis will enable the farmer to design and plan his production system after examining closely the different factors and determinants that characterize his farm ecosystem.

**SWOT Analysis**

Processing/analyzing data from the three (3) levels, i.e., farm, farming household and the community, be could be done first through the simple process of identifying the factors or determinants that have the appearance of strength, opportunities, weaknesses or threats commonly called with the acronym SWOT or the SWOT analysis.

This process involves going through the information gathered from the three (3) levels (farm, community and farming household) and identifying the factors and determinants that are either strength or weakness. This process pertains to looking at the “WHAT” of things in the farm, the community and the farm household.

Furthermore, strengths or opportunities are factors that are enabling determinants and contribute positively to the success of any plan or endeavor. These are factors that are desirable and by themselves should be maintained, enhanced and developed. In fact, these determinants may often lead to the key solutions to the problems that are identified. From the preceding sample case profile, the underlined phrases are examples of strengths opportunity factors or determinants.

On the other hand, weaknesses or threats are the factors and determinants that are negative in appearance, limiting and constraining; and instead of promoting success to any activity, pose as the stumbling blocks and hindrances. Most often, these factors are causes of problems commonly identified. The phrases enclosed in parenthesis in our sample baseline are examples of the weakness/threat factors.
Why SWOT Analysis?

There are numerous reasons that can be said why we need SWOT analysis some of which, could be mentioned here. The strength and opportunity factors and determinants help the farmers:

- identify the strategic potentials in the farm, household and community that could influence changes towards a better and desirable situation. In this case, achieving an ideal farm ecosystem;
- locate functional and ready-at-hand capabilities that are within reach and means, the key is only to strengthen and make use of these capabilities;
- start production initiatives without having to spend additional labor, capital and time; and
- understand better the scope and extent of possible development one can do to his production system.

On the other hand, the weakness and threat factors and determinants help farmers:

- assess the problem areas in his production system and find solutions to these;
- recognize and later avoid or eliminate the undesirable factors and determinants as these could not help farmers achieve a desirable end;
- identify the causes and reasons for the bad state of his production system; and
- points to the priority concerns and issues that have to be addressed and attended to.

It is good to pinpoint as many SWOT factors so that in the analysis process, there will be wide range of issues to refer to, especially in identifying the root causes of problems. To do the task, it would be helpful to list down in a separate sheet of paper the list of SWOT factors that could be found in the narrative or visual report.

Looking at Significant Trends

When the general category of the positive and negative factors across the three levels of information sources (farm, household, community) have been established. Proceed to the next step of analysis.
This process is called "trending" or finding the significant trends in all the information gathered at hand. For this purpose, significant trends are the factors and determinants that show a great impact in the farm, community or household situation. This is characterized usually by an emerging pattern of factors and components that portrays a dominant effect - either positive or negative. As the name connotes, this is identifying the "trend," the direction and orientation of a group or a set of factors that exhibits an almost identical and related field.

The trend that comes out from the different sources of information may already indicate the "cause-and-effect" relationship of certain factors and determinants. By looking at it, one can already perceive a pattern of the situation and can already establish some points for further analysis and investigation. By and large, the trends also provide temporary findings and conclusions that could already stand by itself. However, firming them up through validation and further investigation would result in a more reliable reading of the situation at the end.

*Why trending?*

Finding the significant trends helps farmers in the following ways:

- It helps farmers focus only on significant information that are relevant and those that have an immediate impact on his production system and life in general;

- It gives focus, concentration and attention on immediate problems and helps determine the priorities to be attended to in the short term and long term.

- It eliminates the burden of attending to too many information and data that do not pose significant concerns in the immediate when taken as a whole.

- It provides greater clarity and picture of the status of the agro-ecosystem as it could pinpoint directly the causes- and- effects of situations and dynamics of the activities.

In finding the trend, we may refer to the SWOT data first as this is the first level process undertaken in sorting out the various data gathered. Or we can go back again to the whole narrative report of the baseline information for a closer scrutiny of information.
**Probing**

Probing means a process of digging deeper into reasons and causes of factors and determinants that surface in the trend as problems, limitations and constraints. This pertains to the “WHYs” of things.

There’s a saying that this issue or problem is only the "tip of the iceberg.” Hence, the greater bulk of it lies beneath the ocean. Similarly, probing helps us dig further the otherwise unseen elements that constitute the primary, immediate and the ultimate causes of the problems as seen in the surface. Tracing them down would help which of these root causes have to be cut or eliminated so that we can resolve the surfaced problems. This is because if we have to direct our attention and solutions to the problems in the surface without analyzing what causes them to happen, we may solve the situation in a short while. However, there will be a tendency for the same problem to crop up in the future as the root causes still exist.

One form of probing, which is still very much a part of analysis is the problem tree analysis. Likened to a tree, a problem has many twigs, branches, leaves and roots that interconnect. As illustrated, a single identified problem could have branches of other secondary problems, which if expanded, will eventually stop at the root causes of these problems. The root causes of these problems are often realized as the core problems. Hence, the solutions and recommendations must be addressed on these. This is also called a "network analysis" as one single problem could be traced to a network of other problems that causes it in the first place.

**Prioritization**

The process of probing will not only give us one root cause of a problem but will in fact provide us with numerous causes of problems or essentially, core problems. Ideally, it would be good to address all these problems in order for us to achieve immediately the desired situation or to make that necessary change to happen in the agro-ecosystem. But this would depend on the different factors such as resources, capacities, manpower and skills one has. Most often, we do not have the convenience and capacities of solving all problems identified at one time. Hence, there is a need to sort the core problems identified and address them one by one by prioritizing, which are the ones that need immediate attention; and which ones are secondary.

Some problems could be addressed in the immediate period, while others require medium to long term solutions. Hence, we need to sort out the problems and issues identified in our earlier processes so that we can focus our energies, resources and capabilities in solving problems one at a time. This is the process of prioritization. This means that we have to rank problems according to priorities and address those that are urgent or highly dominant
problems that result to a wider negative impact; and treat minor problems as least priorities.

Most often, we are so engrossed in looking only at problems but we oftentimes neglect prioritizing also our strengths and opportunities.

It’s good also to identify which are our strongest points and pick up those that are readily available at hand, directly applicable, and could be immediately functional. These are important since they could provide us with available resources to address the core problems identified.

**Strategies Options and Recommendations**

Once we have sorted out our priority problems and strengths, we now can move into the process of providing strategies and recommendations as an initial step in addressing the problem/constraints identified, as well as building up the strengths and opportunities present at hand.

Strategies and recommendations could be general at first. There could be many strategies and options for a single strength or problem. But just as we prioritize problems and strengths, we need also to prioritize our strategies and recommendations based again on our capacities, skills and resources.
Putting the options and recommendations into action requires some concrete steps and activities and a little system of organizing these activities to form a coherent form of action. This process of doing this is what is called “planning”. 

Recommendations and solutions by themselves could not effect a desired change or would not solve the problems unless these are put into a plan of action. Just like an army general, he first has to assess the strength and weakness of his enemy before he could devise a plan of action that would ultimately earn him victory. Like him, we too have undergone the process of assessing and analyzing the situations in the agro-ecosystem. We are now ready to come up with a plan of action that would hopefully win us the battle against problems in our production system.

Elements of Planning

Essentially, planning is devising a set of interrelated actions and activities coupled with harnessing and systematizing resources, capabilities and skills to achieve a desired situation and vision which is better and improved than the previous one. There is careful thought-work process involved to guide actions towards the desired end. We have known how numerous activities - if uncoordinated and directed for no clear purpose, have wasted capital and energies of people and institutions. Planning then provides the compass with which activities could bear fruit and effect meaningful change. For this reason, we must consider the basic components of planning.

1. Setting Up the Objective/Goals

The first consideration of a plan is to be clear of what one wants to achieve. What is the purpose, expected outcome being envisioned for which skills and resources would be deployed over a shorter and longer period of time? This part of the plan is the heart for which all succeeding components of the plan depend. The goal or objective sets the tone of the change that one hopes and desires after examining and analyzing the present situation. This will be the governing motivation that sets the direction of succeeding actions. The goal of what one would do and achieve should be made specific, one that could measured, can be achieved within a specific timeframe, must be realizable and appropriate.

2. Critical Activities

To achieve the objective and goals, the plan must outline the critical steps or activities, which when properly executed, would lead to the realization of
the goals and objectives. The critical steps and activities demonstrate how the goals and activities would be achieved.

There must be careful selection of different activities and steps. Appropriateness of the activities should be considered and it must be clearly perceived that the resulting outcome or effect should lead to the attainment of the set goal. It must be remembered that implementing the activities may not necessarily lead to the attainment of goals. This is especially the case when the identification of activities is not closely related to the goal and objective.

In our last topic, the options, strategies and recommendations are helpful references where one could get insights as to what appropriate actions are necessary to achieve the identified goal/objectives.

3. **Set Indicators of Achievement**

To help farmers know that they have already achieved the goals and objective set, there must be some indications that tell him so. Outlining a set of indictors for goal achievement provides the opportunity for farmers to determine and measure whether his critical steps and activities lead to the fulfillment of the objectives and goals set. The indicators will tell what activities and components would be strengthened and avoided so that the action plan would run smoothly in its intended course and direction.

4. **Schedule of Implementation**

Having set the objective/goal, critical steps or activities as well as the indicators, a plan must have a timeframe that sets the implementation of the different activities outlined. Also, setting the time would determine the various time elements and sequence in implementing the activities. It provides the delimitation when the activity should ought to begin and stop. Arranging the regular periods of implementation provides the rhythm of activities and put all things in their proper time and place.

5. **Persons-In-Charge**

Equally important as with all the planning components, no activity would be realized basically if no one will take responsibility in its execution. Putting responsible individuals will ensure that the tasks outlined are carried out, accountability for implementation or non-implementation of task is structured and numerous activities are being shared.

It is important that persons involved to carry out the task of the plan must have a full understanding of the plan objectives and its critical activities. He must be fully aware of the concept and framework that guides the plan of action he participated in. There must be a process of participatory leveling.
off among persons-in-charge of responsibilities, so that their actions are supportive of each other and do not move in separate directions. Finally, their full understanding of the context of the plan would conveniently situate them in a better position to monitor and evaluate its progress and impact over a period of time.

6. **Budget**

Outlining the cost allocation of the planned activities provides the overall direction of the capital requirements needed. Costing provides ideas for critical decision-making whether the plan outlined would be feasible and attainable in the end. It will help settle some adjustments in defining the activities that would be finally implemented and make it realizable in the end.

7. **Application**

The farm plan should necessarily be written as this will guide all stakeholders in implementing the activities. It is difficult to keep track of the different goals and activities unless a concrete plan is written. However, it must be remembered that a written plan is not meant to be kept in the drawer. It should be the guidepost that must be referred to, time and time again, in the course of implementation.

Also, in working out a plan to create changes, innovations and patterns in the physical layout of the field and community, visualization is an effective instrument. Visualization offers an excellent medium whereby the envisioned change is clearly designated in specific form and structure. It provides a dimensional perspective that puts the desired change in living reality and produces sustained interest or motivation to those who are involved.


Quicoy, Cesar B. Farm Planning and Budgeting Lecture Notes. Department of Agricultural Economics, College of Economics and Management, University of the Philippines Los Baños, Laguna.