

# HOUSEHOLDS, AGROECOSYSTEMS AND RURAL RESOURCES MANAGEMENT

Clive Lightfoot  
Shelley Feldman  
M. Zainul Abedin



Bangladesh Agricultural Research Institute (BARI)  
and  
International Center for Living Aquatic Resources Management  
(ICLARM)

**HOUSEHOLDS, AGROECOSYSTEMS AND RURAL  
RESOURCES MANAGEMENT**

**A guidebook for broadening the concepts of  
gender and farming systems**

**by**

**Clive Lightfoot**

**Shelley Feldman**

**M. Zainul Abedin**

**1991**

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# PREFACE

This guidebook attempts to broaden thinking about gender and farming systems. These concepts are explored here to broaden understanding of the complex relationships that comprise households, agroecosystems and the way rural resources are managed. Such understanding will have long term implications for research because it helps researchers see why earlier research efforts fall short of needs and interests. These research efforts fall short in bridging the gap between multi- and interdisciplinary research and in generating appropriate technologies to enhance rural resource management, particularly for women. It also falls short in the development of action research and extension activities that meet the needs of rural communities - women and men.

The process by which this guidebook was developed consisted of a four-day workshop held at the Bangladesh Agricultural Research Institute (BARI) between 11 and 14 September 1990 and a four-day pretest of the first draft held at BARI between 4 and 7 March 1991. Credit to the workshop participants who provided the drawings, experience and their judgment is given. These activities received assistance from the International Center for Living Aquatic Resources Management (ICLARM) and the Department of Rural Sociology, Cornell University. The first workshop determined the feasibility of developing self-learning material on awareness of gender issues and farming systems and developed a prototype. The prototype guide was field tested at BARI after which considerable changes were made. Various draft manuscripts were reviewed by experts in the fields of gender and farming systems research. While we have attempted to consult widely and have received assistance from many, mistakes there will be, and these remain our responsibility.

Clive Lightfoot  
Shelley Feldman  
M. Zainul Abedin  
Dhaka, Bangladesh  
March 1991

# RATIONALE

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Many scientists, extensionists and development workers are actively engaged in research and extension activities for the improvement of farming systems. Recent interest in sustainable agriculture through the wise management of rural resources requires them to broaden their concepts of gender and farm systems.

Many institutes are already incorporating women's issues into their research. These efforts, however, remain fragmentary and descriptive. With the increasing visibility of women in field work, crop processing and resource management decisionmaking, scientists have come to appreciate the invisible roles women have always played in sustaining household livelihoods. With the expanded visibility of women in agriculture due to male outmigration and declining family wages, women are being recognized for the central role they play in managing rural resources. The numbers of households headed by women have increased, thus adding to the importance of women in today's agricultural systems. Such recognition has significant implications for the ways in which researchers understand agricultural production and thus for the ways in which they do research and provide extension activities that promote sustainable agriculture through wise management of the rural resource base.

On-farm researchers are also striving to integrate better disciplinary and commodity research. This challenges the tendency towards discipline bounded experiments on privately owned or controlled lands answering commodity-specific questions. As researchers learn more about household livelihoods they are beginning to realize the importance of off-farm and non-farm contributions to household maintenance. Non-farm activities are those activities in which households engage that are not related to agriculture. Off-farm activities include agricultural wages, share cropping and in-kind exchanges of agricultural commodities, and the exploitation of common property like water, grazing and forest resources.

Given the many dimensions these issues raise for on-farm research and development workers, training guides are needed to help researchers broaden their understanding of gender and farming systems. Such understanding leads to a dynamic view of the interrelationships between household, agroecosystems and rural resource management and enables more practical approaches to questions of sustainable agriculture.



# PROSPECTUS

The overall goal of this guidebook is to help readers question the assumptions about gender and farm systems they bring to their field work. This guidebook is therefore not a field research method for gathering data but rather it is a way to change thinking patterns. For example, many people assume a farm system is just field crops. People also assume farm systems include only the work of a male farmer. This views both field crops and farmers as separate categories. If these categories are changed to households, agroecosystems and gender relations it encourages more dynamic ways of thinking. The narrow assumptions made about crops and farmers are challenged so that the complex relations that comprise the farm system, household and gender relations can be illuminated. A book of this size and scope does not attempt to explain the reasons—religious, cultural or otherwise—behind the relationships uncovered. Nor does it pretend to have uncovered all the gender relations that can be found in Bangladesh rural households, male or female headed.

By identifying new concepts, researchers recognize what has been ignored in farming systems research so far. They also recognize that to understand how household livelihoods are assembled they must look beyond the farmer and 'his' field to the complex set of social relationships within the household and the rural resource base. These complex relationships include the different and often competitive interests of household members, and the ways in which members bargain to realize household goals. These interests may differ by age, sex and other characteristics of status. The rural resource base includes owned and shared crop lands, off-farm activities on commonly held resources like forests, rivers, lakes and streams, and non-farm incomes.

In sum, the purpose of this book is to change the ways we, as researchers, think about gender and farming systems. Gender, which is now limited to adding women's activities to the research must rather explore the complex interrelationships between men and women which sustain household livelihoods. Ideas of "farming system" must move beyond a collection of discrete enterprises to interactions between activities of people that use many agroecosystems and rural resources. Agroecosystems and rural resources are not limited to field crop production on privately held properties but include common property resources such as rivers, reservoirs, forests and grazing lands.



# HOW TO USE THE GUIDEBOOK



**Scientists hear a briefing.**

This guidebook is designed for self-learning. In using this guidebook you should not forget that the more open your mind is to learn, the more you will get out of it. You can choose to simply read the guide and still get a lot out of it, but if you want to follow it completely you will need several large sheets of paper and some colored marker pens.

## **Notes on the Learning Process**

The design used for self-learning contains:

- A set of learning objectives.
- Exercises for you to do.
- Assessments for you to take.
- Guidelines on how to do them.

The sequence of instruction which is repeated for every learning step, provides:

- Guidelines on how to do the exercise.
- Samples of the outputs to compare with your own work.
- Guidelines on how to do the self assessments.
- A set of self-assessment questions for you to check that you have learned the main points. We supply some suggested answers at the end of the book.

The topic foci in the four learning steps are:

- Step one 'Your Concept of a Farming System', makes clear your idea of what a farming system is through the diagram you draw. This diagram provides the baseline from which you can judge how much you have learned.
- Step two 'Farm Household's Concept of a Farming System', takes you out of the office and on to the farm for a visit to draw out a farm household's idea of a farming system.
- Step three 'Farm Households and Gender Relationships', returns you to the household to elaborate further with them relationships between activities with specific reference to those involving gender relationships.
- Step four 'Farm Households and Agroecosystems', entails the exploration of the different agroecosystems exploited by the different enterprises.

## **Notes on Interviewing Farm Households**

As much that can be gained from following this guidebook depends on the readers' ability to interview households, notes on common mistakes made while interviewing are given.

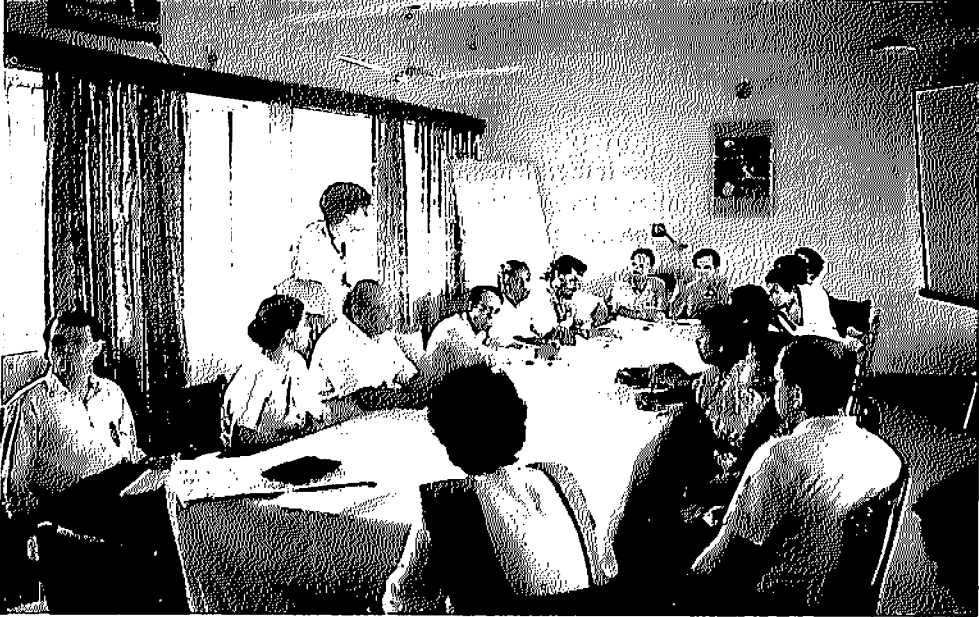
- Arriving on the farm at a bad time. One should check that households can receive you at the times you propose. This is particularly important where female members of the household are to be interviewed.
- Arriving on the farm with a large number of scientists. This not only intimidates the person but also denies you the value of arranging your interview so that you empower women and other disadvantaged groups to speak out. More knowledge and experience is gained where a few interview many.
- Arriving on the farm in city clothes and giving orders. This only serves to increase the distance between you and the farm household. Your attire and attitude are powerful signals to rural folk; what they say is largely determined by how close you can get to them.
- Rushing the interview. This usually results in you reconfirming what you already know because the unhurried exploration for new insights and cross checking has not been possible. Relax, listen more than you talk, and show respect of their knowledge by following up on leads offered by the household.
- Forcing your agenda. Our overriding concern to get the output needed and conclude the interview quickly, reduces the quality of our data and our relationship with the household. Rather we should let the information emerge naturally. Forcing households to draw diagrams not only results in you drawing the diagram for them, but also in the household finding little value in them. This makes it difficult for you to return. If households learn from the interview they will invite you back.
- Continuing on with a bad interview. When, for any number of reasons, you find yourself interviewing household members who are distracted by other matters, as happens to us all, recognize the fact and tactfully withdraw. It is better for you and others that follow you, to have good relationships with the community rather than good data on the community.

## **Notes on Preparing Conceptual Diagrams**

As much of this book is about drawing conceptual diagrams, some clarification of what we mean by this is given.

- The term concept is used here to mean an idea. Thus the concept of a farming system is the idea of farming systems in general and not the actual farming system of one particular farm. The concept of a farming system is often easier to express in diagrammatic form rather than in words.
- The conceptual diagrams we seek in this exercise should not attempt to document details of a particular farming system. What is sought here are the important and common activities and relationships that occur. You will find that if you try and draw everything that goes on in the farming system you are investigating, your diagram will become hopelessly confused and of little use.
- We seek a general picture in these exercises because we are interested in changing the way we think and not in gathering specific information about a specific farm household as we would in a household survey. This is not a manual about farmer participatory or rapid rural appraisal methods. It is a guidebook to clearer thinking about the role of gender and farming systems.
- Our generalized conceptual diagrams should include activities that occur in any season and in any place. Thus seasonality is captured as are fuelwood gathering from faraway forests and fishing in distant rivers.
- Because we are concerned about farming systems and not rural livelihood systems, the diagrams shown here do not contain information about remittances, migration and rural industries.

# LEARNING OBJECTIVES



**Scientists debate what they have learned.**

The exercises that follow will show us that there are a variety of ways to understand farming systems and to gather information about them. Each exercise provides an opportunity to learn new ways of thinking, more accurate interpretations of farming systems and more relevant ways of working with farm households. Specifically you can learn:

- That having household members diagram their farm system helps capture the full range of household activities of the farm system. Diagrams also highlight the complexity of the system, challenging pre-conceived ideas held about the farm system and rural resource management.

- That women are integral members of households' production practices and have specialized knowledge about agriculture. Women also have information about their own labor expenditures as well as specific information about their particular responsibilities and decisions in the management of rural resources.

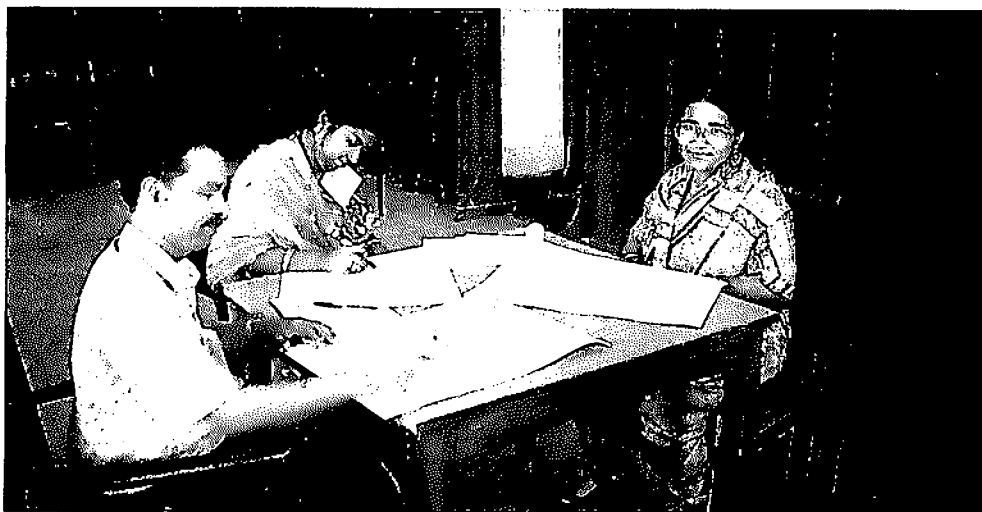
- That farm production covers many enterprises which exploit different types of agroecosystem. In many cases these agroecosystems will be common property resources like forests, grazing lands, rivers and streams.

- That diagrams and interviews are helpful techniques to understand how a farm system operates.

- That informal group interviews and specific questions relating to our own and farm households' diagrams broaden understanding of the households' management of rural resources.

## STEP ONE

### YOUR CONCEPT OF A FARMING SYSTEM



**Scientists set down their own ideas.**



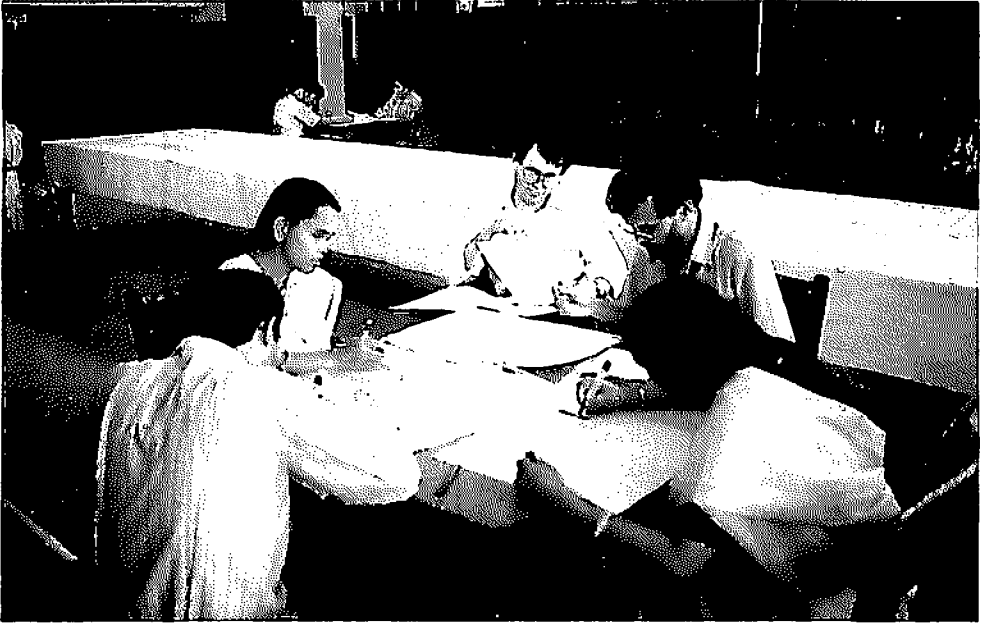
## ***Guidelines for Drawing Your Concept of a Farming System***

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- *Take a large sheet of paper and some colored marker pens and make a diagram of your concept of a farming system. By concept we do not mean a description of a particular farm, but a picture of key activities and relationships that are found in the farming systems you are familiar with.*
- *You will use this diagram to explore your present interpretation of farming systems. This diagram will also provide a starting point for broadening your ideas on households and rural resources management.*
- *Complete your diagram and then go through these sample diagrams, study the commentaries and see how your diagram compares with those shown.*
- *What follows are a series of sample diagrams that show how we might draw a farming system from our own experience. Each diagram has a commentary that highlights areas where we can broaden our thinking.*

## Sample Diagrams of our Concept of a Farming System

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**Scientists draw their concept of a farming system.**

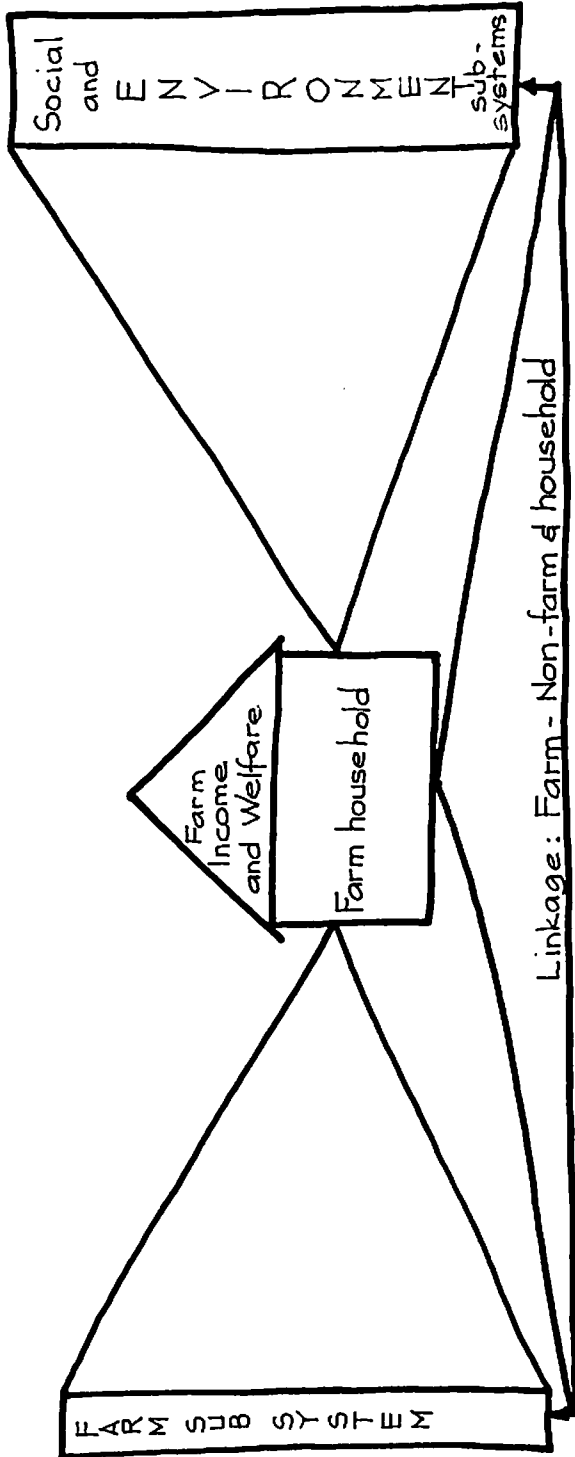


Diagram 1

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**This highly stylized diagram of a farming system notes many attributes of the system but makes it hard to see the actual activities and relationships of the system. With no people or specification of what activities occur in the sub-systems and no identification of the relationships in the categories shown, one cannot know whether this is a plantation, rice farm or cattle ranch.**

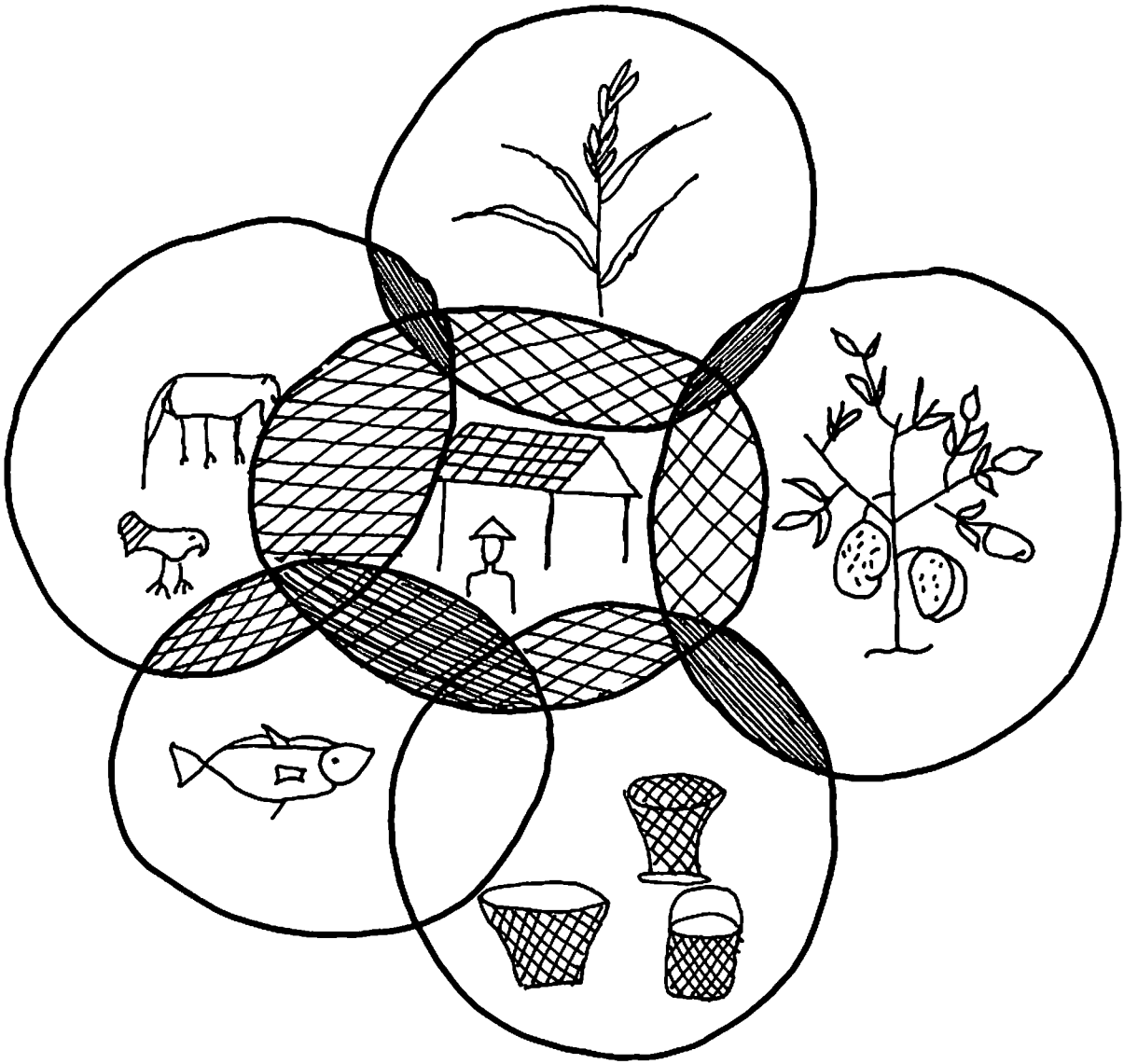


Diagram 2

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**This pictorial diagram of overlapping circles shows a single male actor and some specific enterprises, but not much more information beyond the overlapping circles suggesting different interactions is given. One is left to guess the relationships between enterprises and what types of agroecosystems are utilized.**

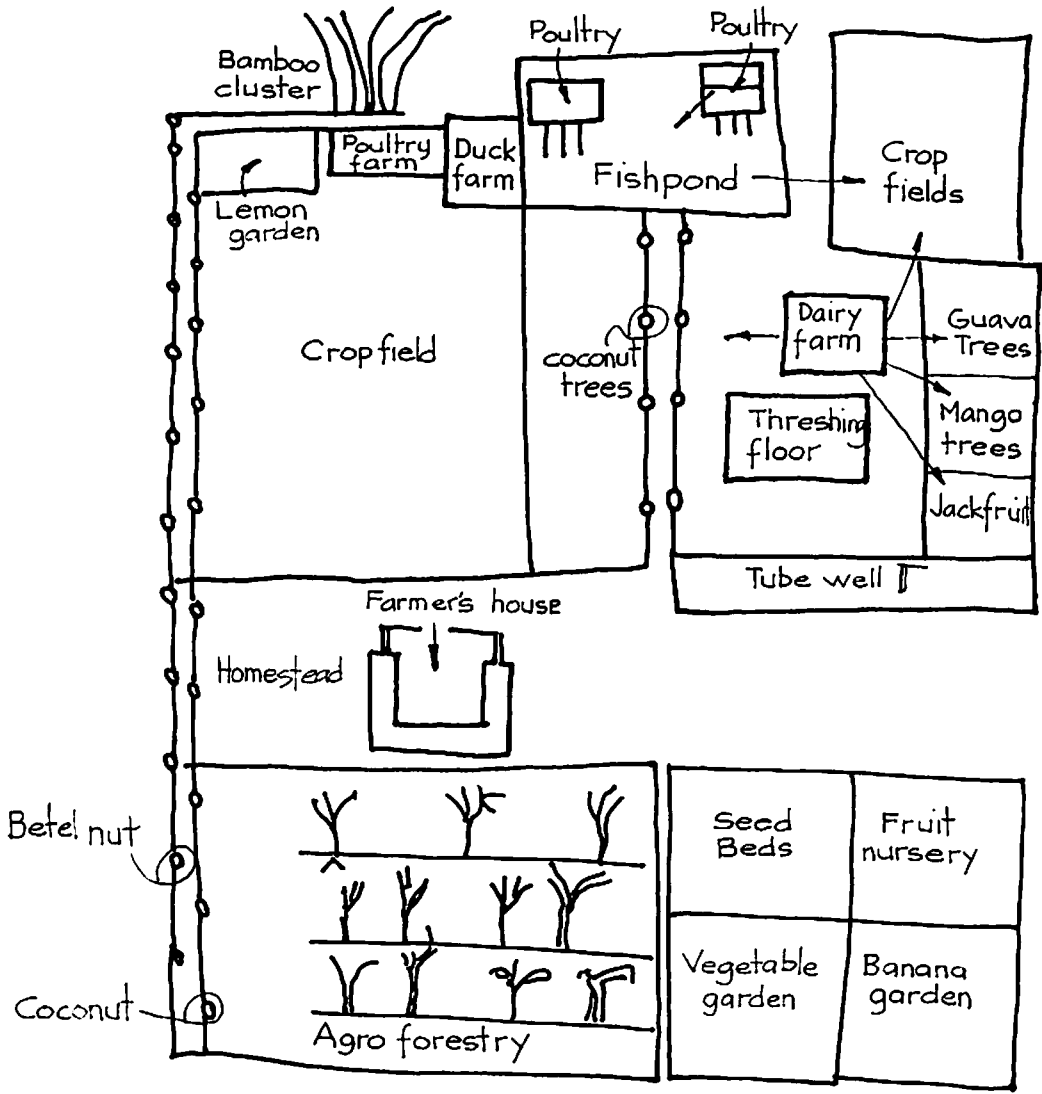


Diagram 3



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**This diagram shows the physical layout of a farm rather than a conceptual diagram. It does show the layout of plots with enterprise labels but activities by household members and interactions between enterprises are left unknown. Farm layouts, however, are not diagrams of your ideas and it is the way you think that this exercise attempts to make clear.**

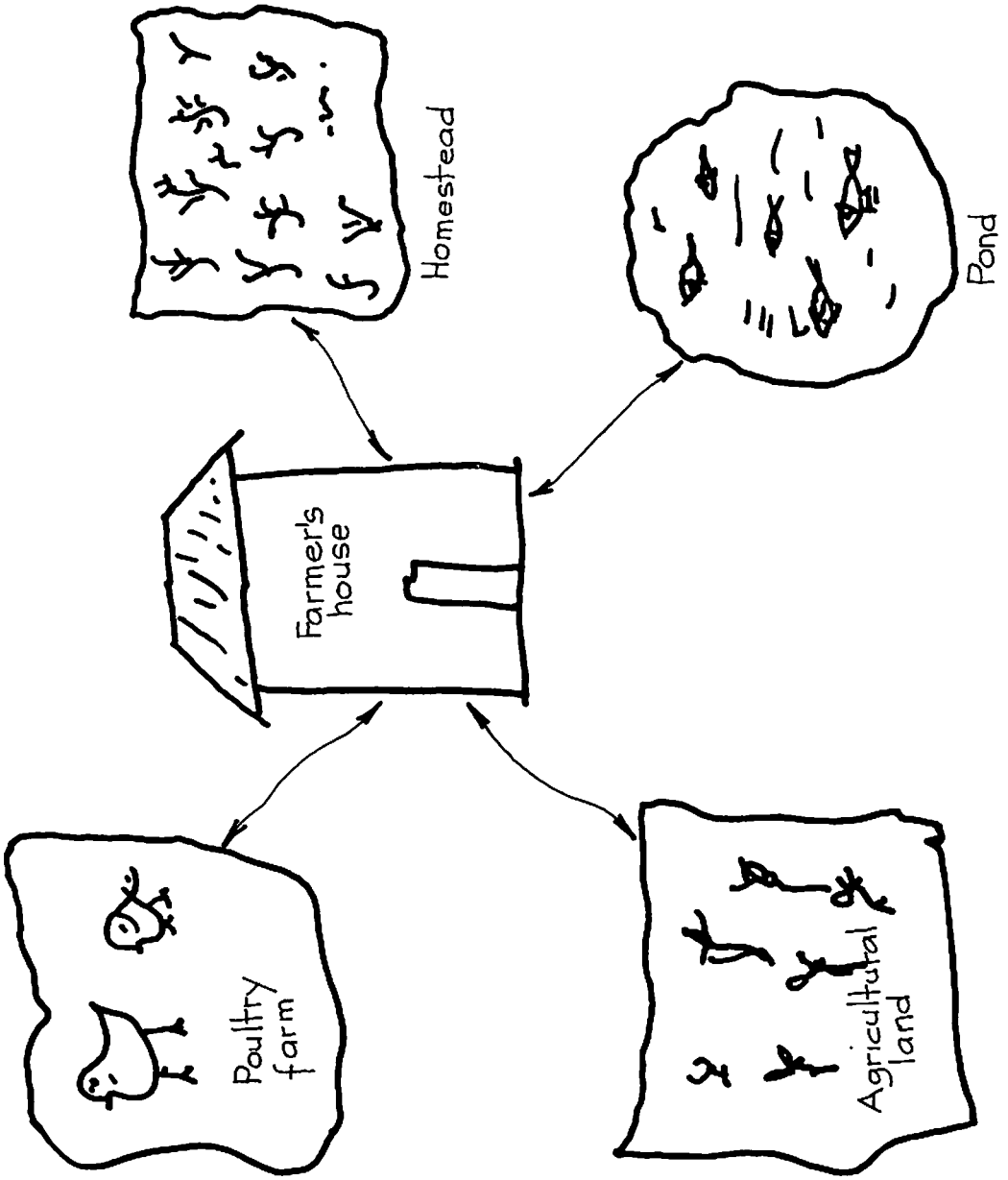


Diagram 4

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**This simplistic box model uses symbols to show a few enterprises which are all linked to a symbolic household. The diagram, however, does not show who lives and works in the household. Similarly, the boxes do not show what is happening along the linkages between household and enterprise. We are left to guess the real resource flows or labor interactions between the compartmentalized and effectively independent enterprises.**

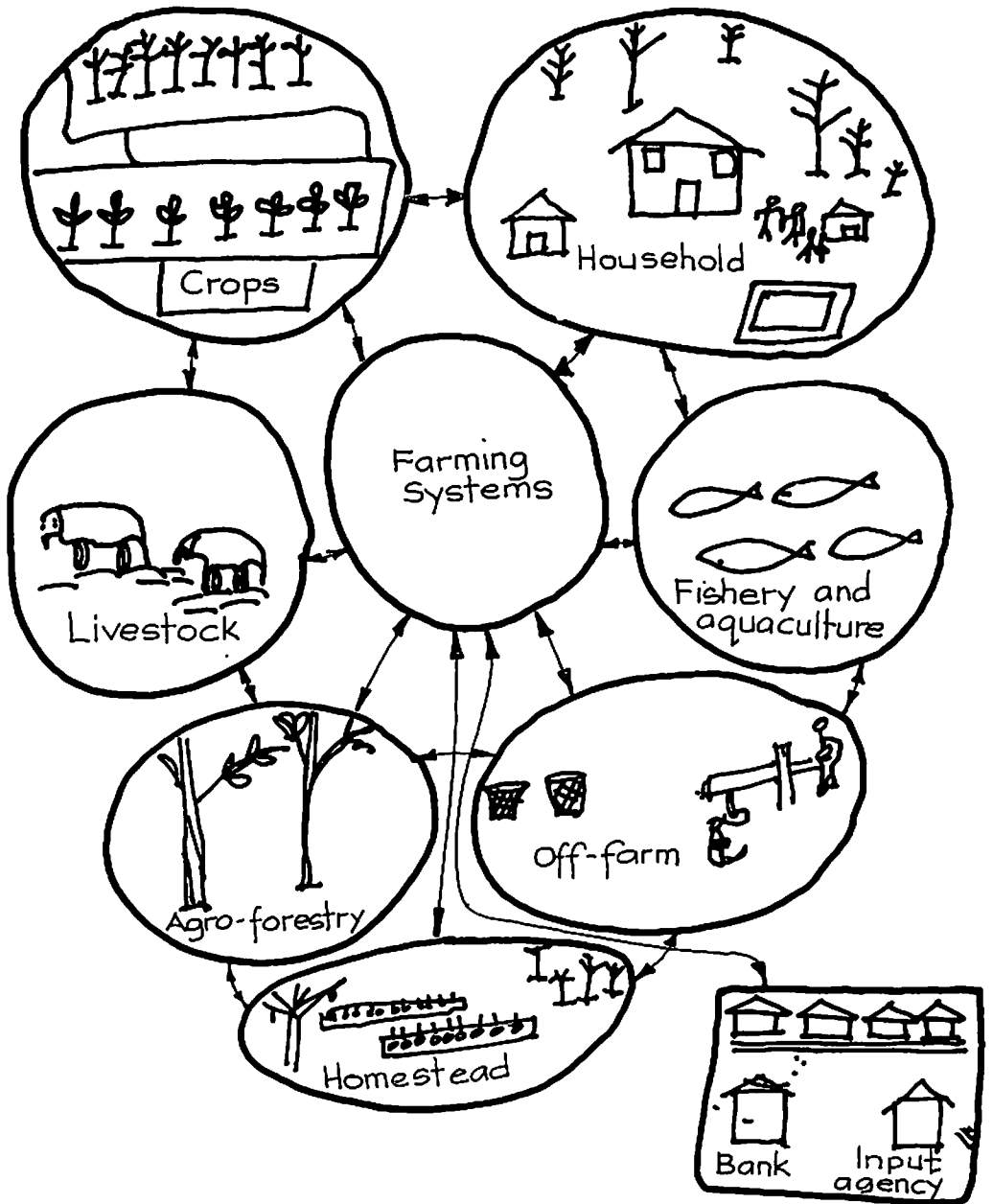


Diagram 5

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**This pictorial box model shows a broad collection of enterprises which include the identification of off-farm markets and agroforestry. However, the few linkages shown have little meaning in terms of resource and labor flows. There is recognition that households include men, women and children, but there is no indication of what they do.**

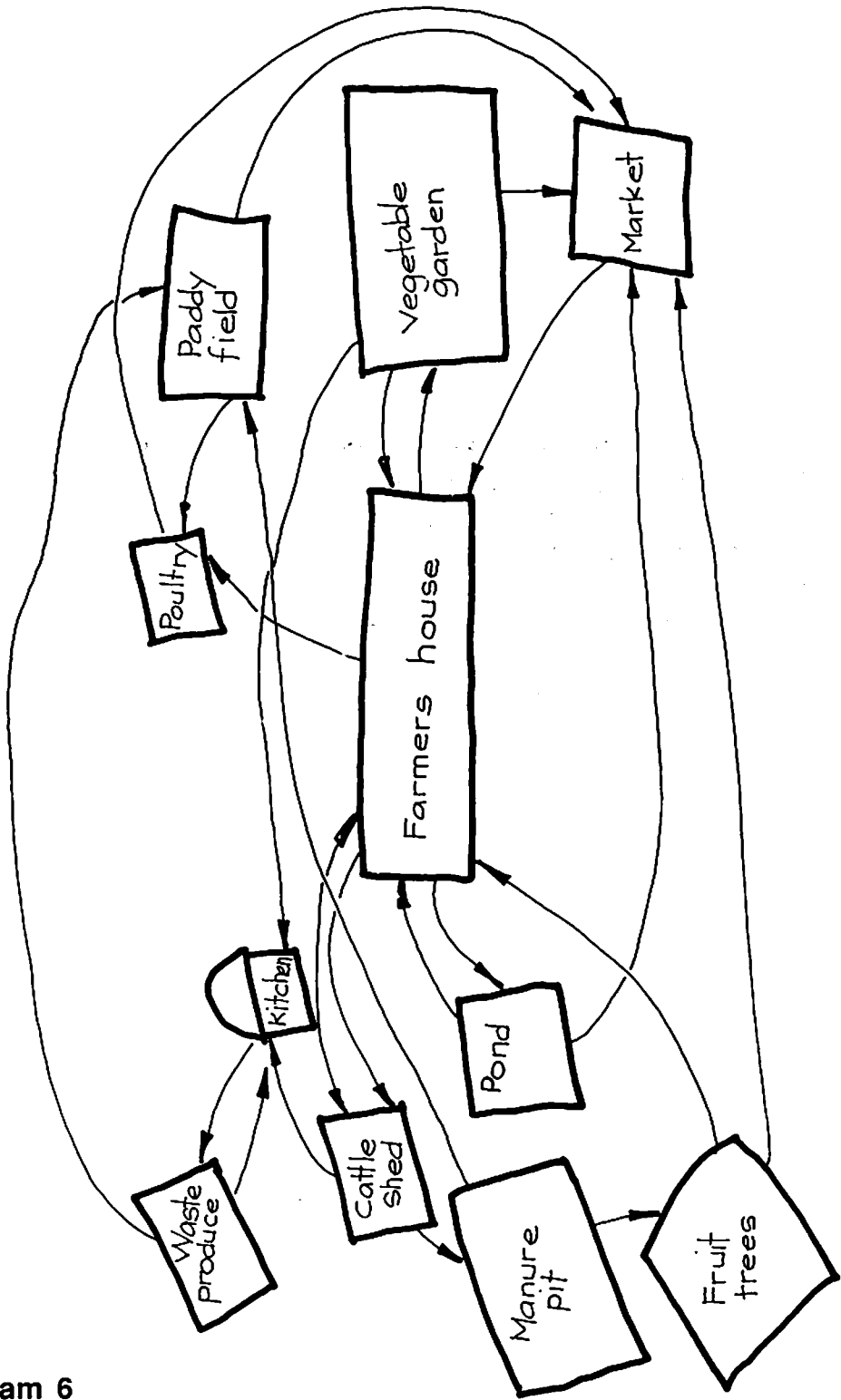


Diagram 6

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**This box model uses words to indicate a wide range of enterprises which are not only linked to the household but also to each other. However, the unspecified linkages between boxes leaves unknown the kinds of resources used and the kinds of flows between enterprises.**



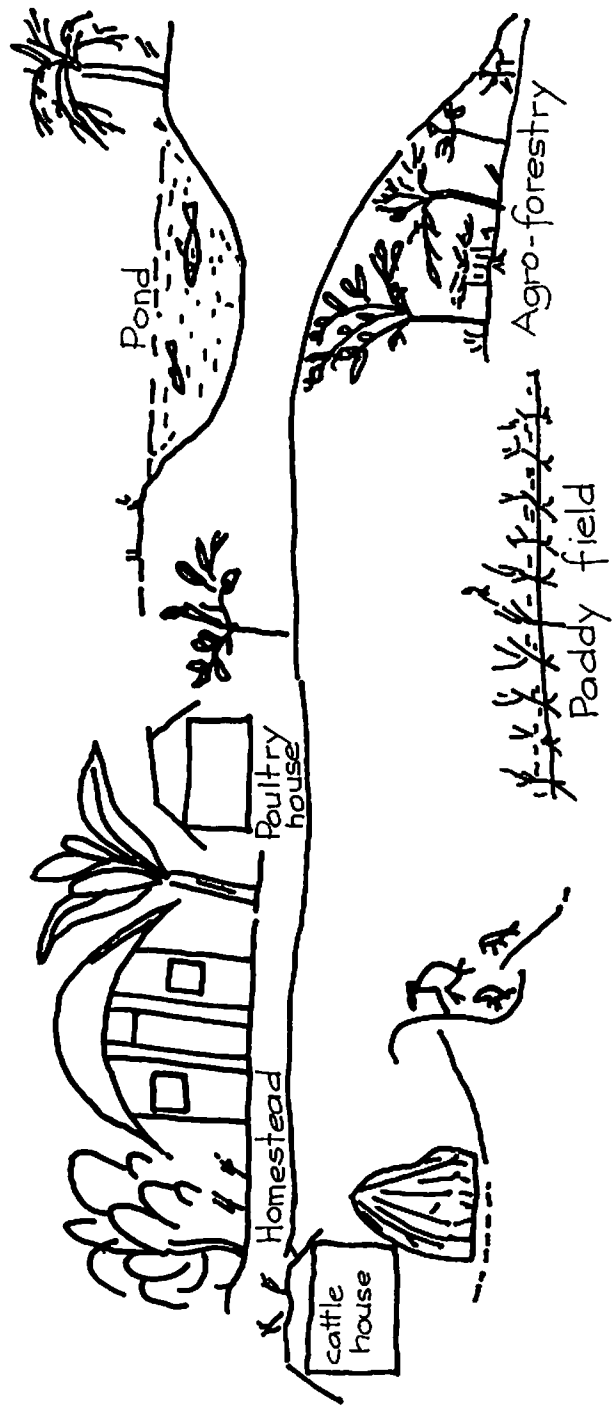


Diagram 7

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**This diagram uses unbounded (i.e., not in a box or circle) symbols to represent farm components. Moreover, the symbols suggest that different agroecosystems are being used for each enterprise. However, the absence of actors and linkages leaves us to guess who is doing what and what relationships exist between the enterprises.**

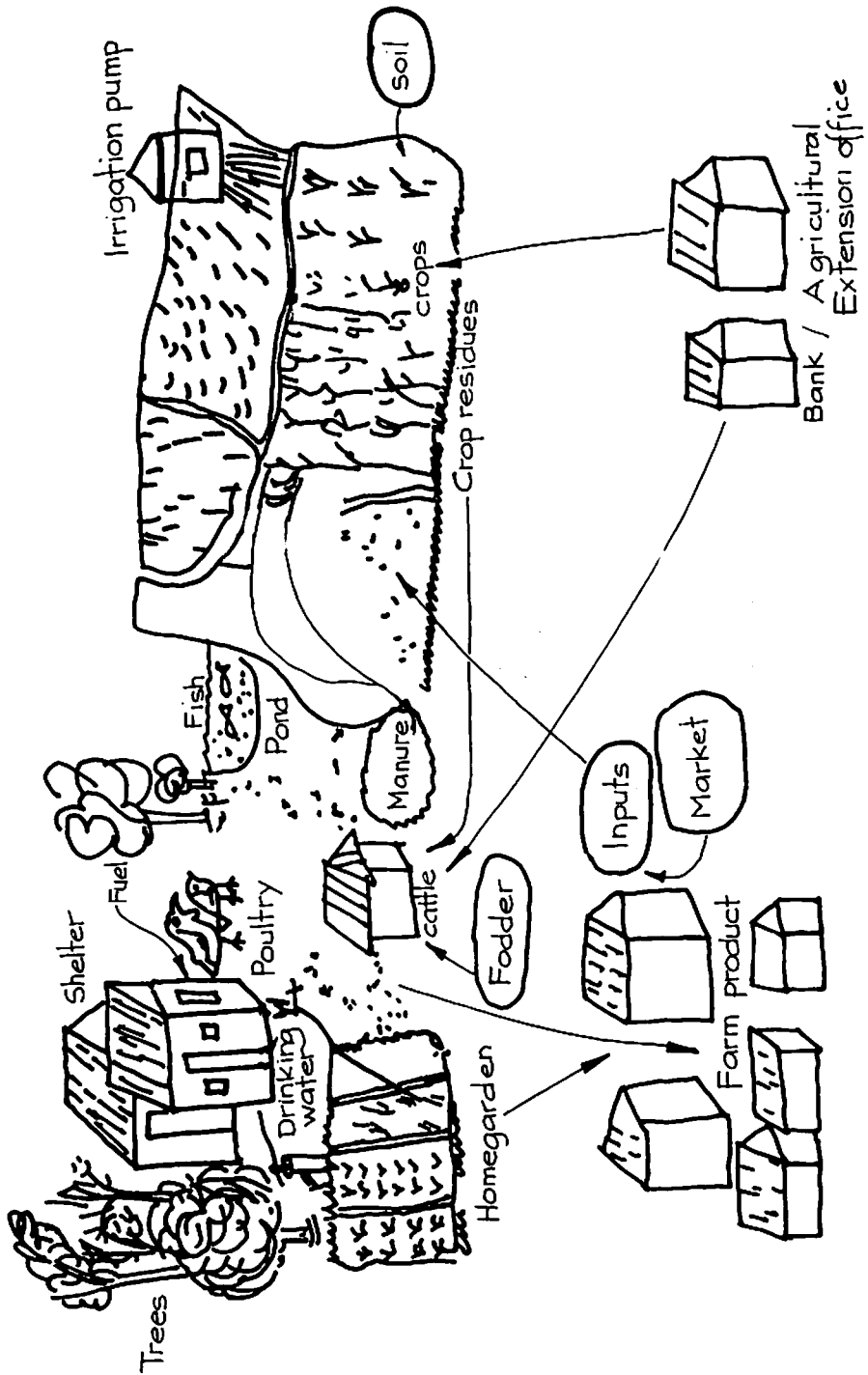


Diagram 8

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**This open view of a farming system using unbounded symbols to depict diverse crop, animal, tree, and fish components located in different agroecosystems such as ponds and hill sides also indicates some resource flows particularly those involving enterprise by-products. Off-farm linkages are also shown but limited to credit and markets. The absence of any actors leaves unknown labor and gender relationships.**

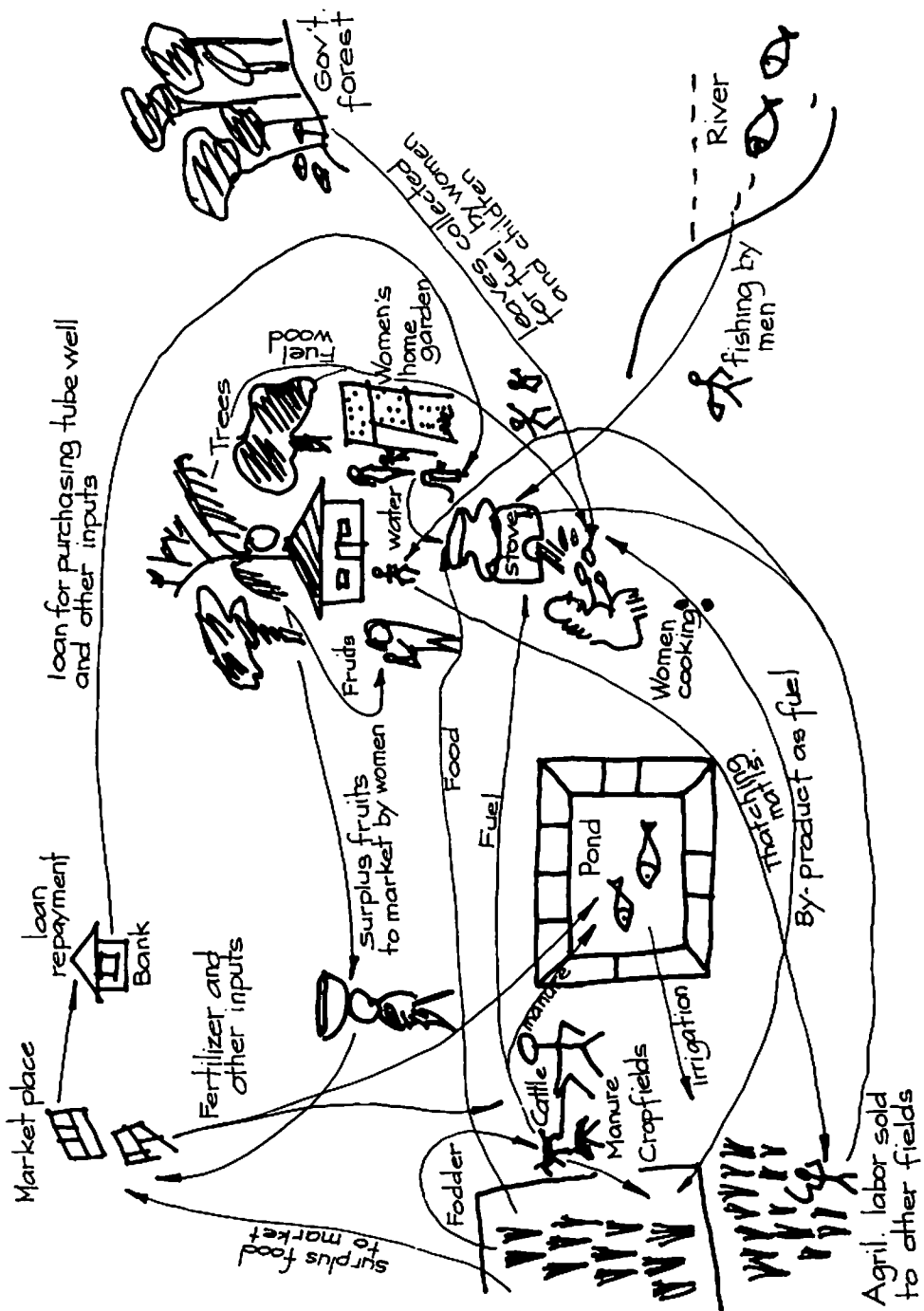


Diagram 9

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**This open view of a farming system shows not only the many market, gender and material flow relationships between enterprises, but also suggests the agroecosystem being used by the enterprise. The diagram also recognizes the utilization of common property resources for fishing and fuel wood gathering.**

## ***Guidelines for Assessing our Concepts of Gender and Farming Systems***

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- *Did you find farming system and gender concepts similar to your own among the samples given?*
- *Did you see how your concepts of gender and farming systems might be broadened?*
- *What follows are a series questions that will help you assess your present interpretation of gender and farming systems.*
- *Go through the following self-assessment and study the answers on page 73 to see how and where your ideas might be expanded. These questions refer to the sample diagrams shown on pages 10 to 26 and not the diagram you prepared.*



## Self-Assessment on our Concepts of Gender and Farming Systems

1.1. A farm household is likely to have more than one of its members engaged in agriculture?

(mark box of your choice)

true or  false

1.2. Are women and children productive assets of the household?

(mark box of your choice)

yes or  no

1.3. Who in the farm household can be a farm laborer?

(mark box(es) of those that apply)

- children
- female adult family members
- male adult family members
- hired laborers

1.4. Which of the following agroecosystems may be included in a farming system?

(mark box(es) of those that apply)

- rice paddies
- canals
- rivers
- forests

1.5. Farming systems include off-farm activities?

(mark box of your choice)

true or  false

1.6. What kinds of resources usually flow between enterprises?

(mark box(es) of those that apply)

- labor
- cash
- waste and by-products
- commodities

Turn to page 73 for answers.

## STEP TWO

# A FARM HOUSEHOLD'S CONCEPT OF A FARMING SYSTEM



**A woman shares her technical knowledge.**

## **Guidelines for Visiting Farm Households**

---

- *Now it's time to visit farm households to obtain their concept of farming systems.*
- *We'll do this by making a farm visit and encouraging household members to draw their own diagram of their own concept of a farming system. You may wish to study the notes on preparing conceptual diagrams on page 4 at this time. If you are intending to visit a village where you are not known make sure that appropriate arrangements with the village leadership have been made.*
- *On this first visit to the household you want to concentrate on finding out the main activities of the farming system and the main relationships between them. This is the only checklist you need. Do not try to get too much detail at this time. Concentrate on getting an overview of the whole system. Detail can be obtained on subsequent visits. While you will start by looking at what is happening now your information must cover the whole year. We seek to learn the usual, the typical, or the general circumstance. Remember it is the household's concept we want, not a diagram of their actual farm as it is on the day of your visit.*
- *Here's the procedure to follow when you visit the household. For those readers who are unfamiliar with interviewing farmers you may wish to study the notes on interviewing farm households on page 3 at this time.*
- *Introduce yourself in a courteous manner to the head of the household and tell the family that you want to learn from them about their farming activities. The fact that you want a diagram of their concept of a farming system should not be mentioned explicitly at this time. The terms "diagram" and "concept" will only confuse. The diagram should emerge from the process as the best way to capture the information the household has given.*

*continued*

## **Guidelines for Visiting Farm Households (continued)**

- *Ask the men and women in the household to walk with you through the farm. We do this because it helps people feel at ease, it helps us see what questions to ask, it allows household members to show off their knowledge, it enables the household to forget their immediate chores and recall the information you seek. Do not forget to cover the housing area, and common property resources like rivers and forests. As you walk along ask questions about the activities, enterprises, and ecosystems you see. But do not forget to ask about what happens in other seasons and in places too far to visit.*

- *After about thirty to forty minutes walking, gather together as many household members - men, women and children, as possible in a central place for discussions about what you have seen and talked about.*

- *After ten to fifteen minutes discussion stop it and suggest to the family that the information they are providing is too much to keep in your head and is better recorded by drawing it on the ground or on a piece of paper. Continue the discussion but ask those present to help you make the drawing. As soon as the family feels confident let them do all the drawing. Teenagers attending school are particularly good at drawing diagrams. This devolution of work from you drawing to the family drawing should also occur in the dialogue. Initially you will be prompting the household for information but as the diagram takes shape the family will take over and you will only be listening. These drawings usually take between sixty to ninety minutes to complete if you do not attempt too much detail.*

- *What follows are a series of sample diagrams that show how farm households drew their concept of farming systems. Each diagram has a commentary that highlights areas where we can broaden our thinking.*

- *Go through these sample diagrams, study the commentaries and see how the diagram you obtained from the farm household compares.*

## Sample Diagrams of the Household's Concept of a Farming System

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**A good place to listen to the household team -  
wife and husband.**



**Mother-father-son share their wisdom.**

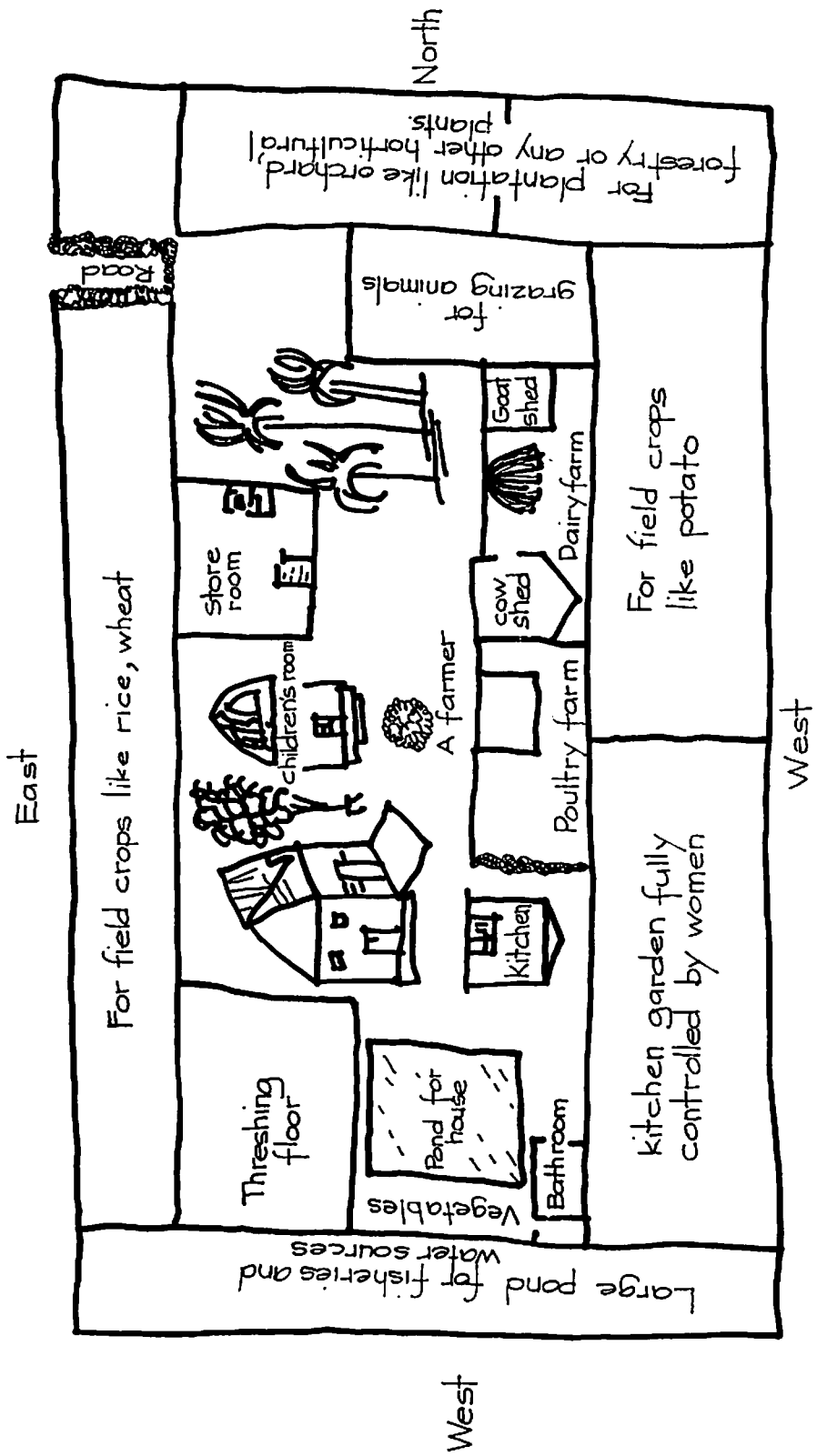


Diagram 10

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**This diagram of the physical layout of homestead and crop lands shows the spatial relationship between plots of land. It is not, however, a conceptual diagram of a farming system. In your interaction with the household a spatial layout of their actual farm has become confused with a conceptual diagram that represents the activities and relationships of their general idea of a farming system.**

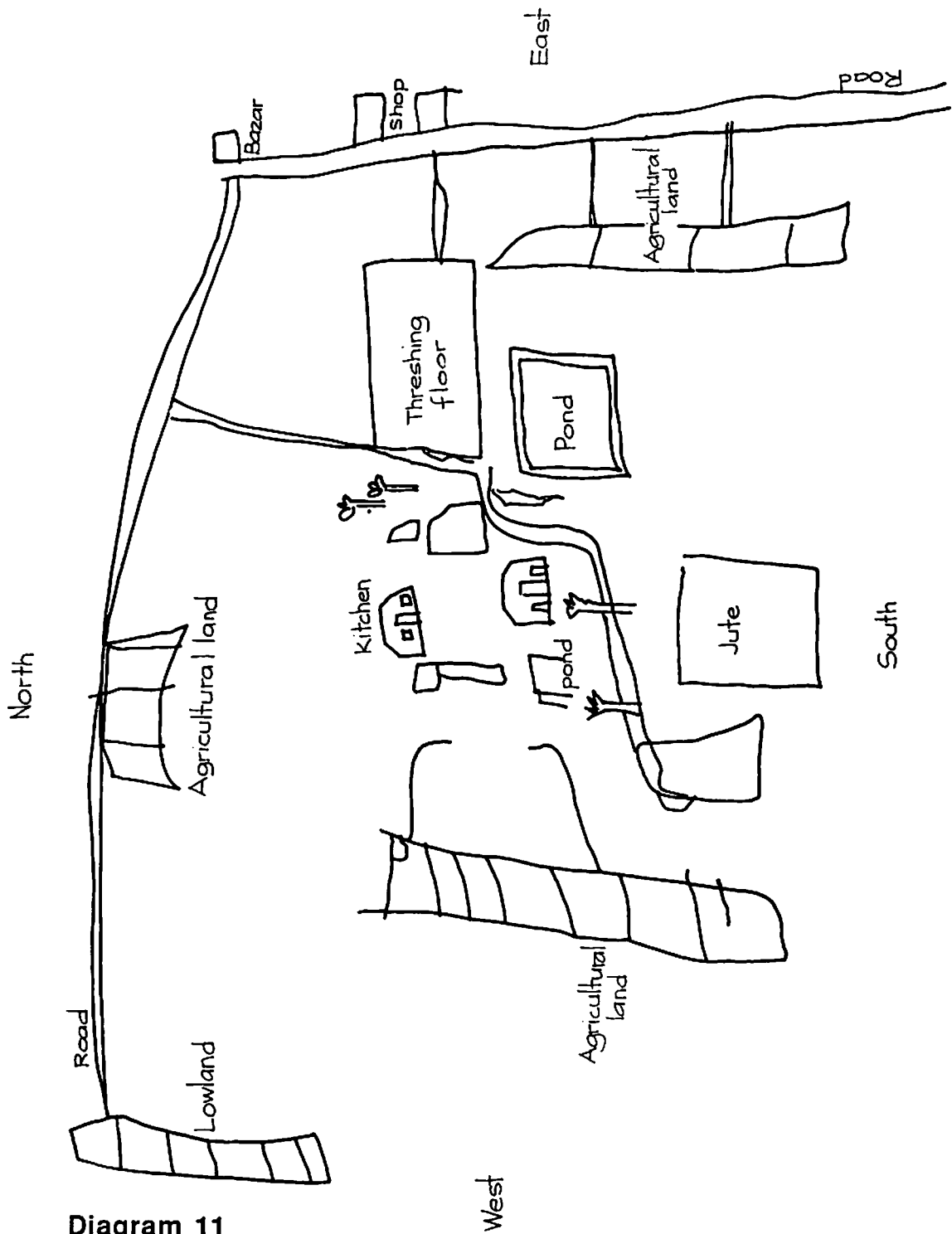


Diagram 11



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**This farm map is another example of how we can confuse the household. This kind of confusion usually occurs when we have not allowed the diagram to emerge as a natural way to depict on paper all the activities and relationships discussed.**

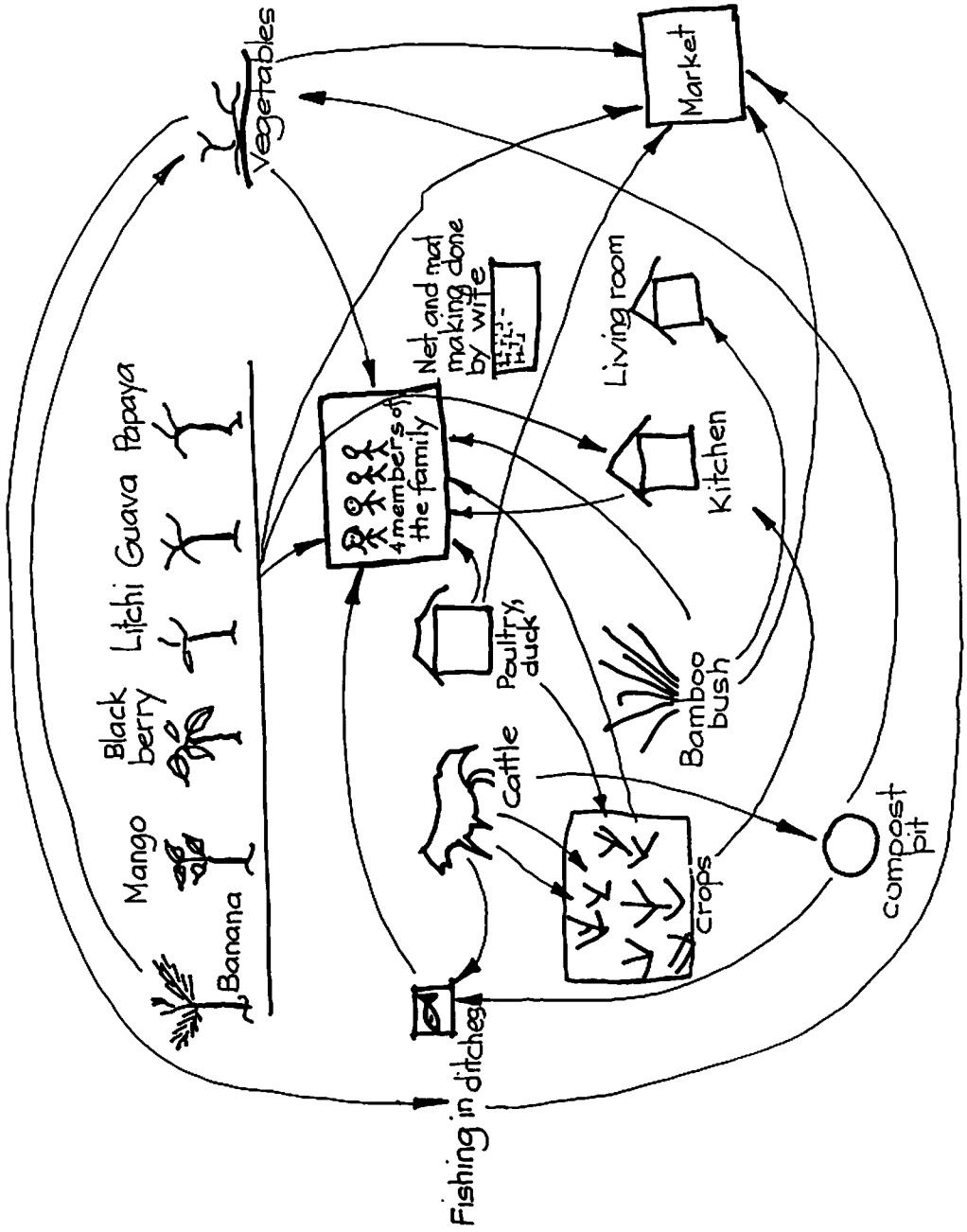


Diagram 12

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**This open style diagram shows several linkages between enterprises and some bioresource and capital flows are specified. Some enterprises like agroforestry are perhaps too detailed. Crop fields tend to be shown as boxes which give little indication of the agroecosystems. The diagram also recognizes that households include a diverse set of members but does not specify what they do and how they may differently participate in farm activities. The one exception is the women's off-farm and non-farm activity.**

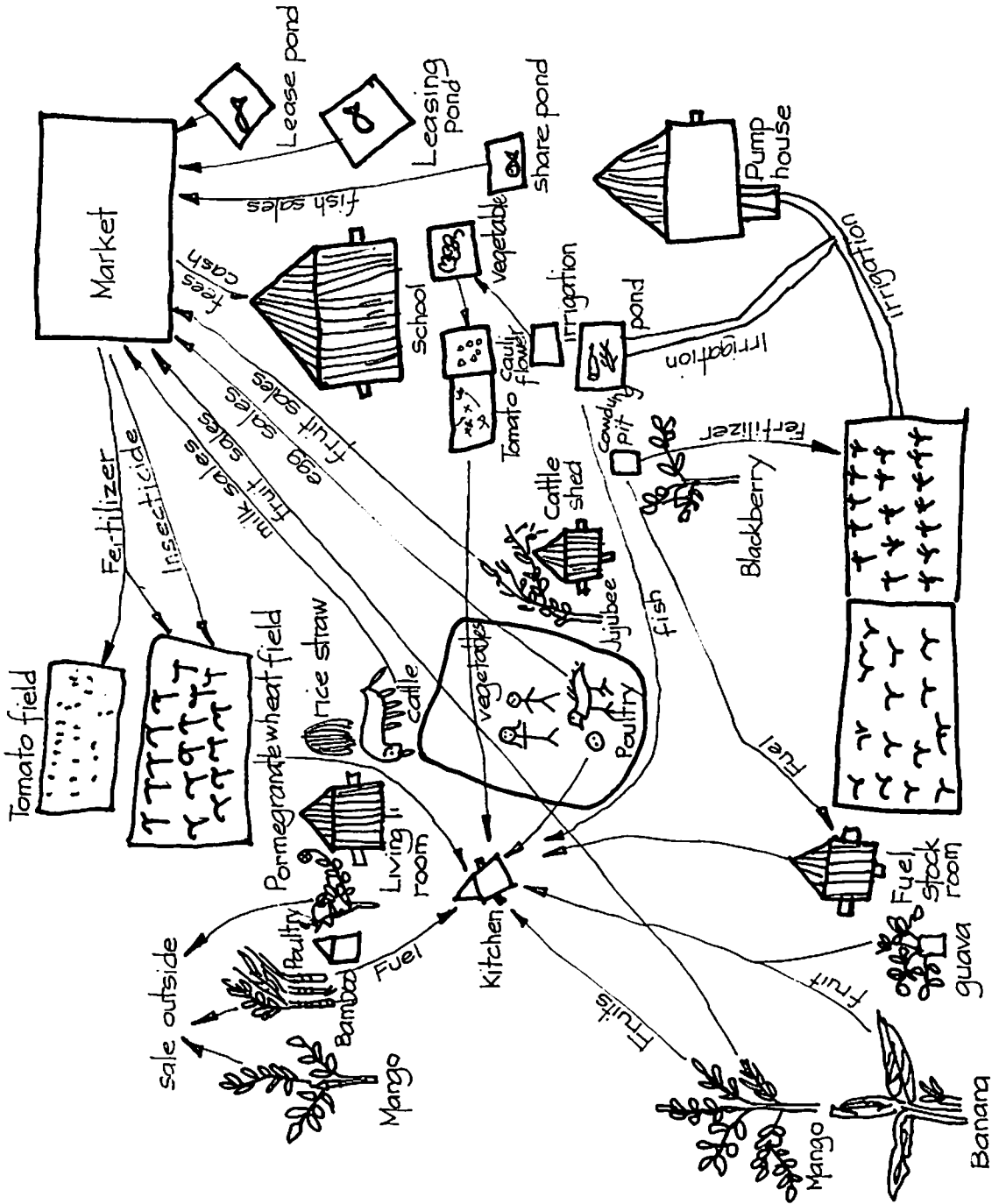


Diagram 13

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**This pictorial diagram identifies many enterprises and relationships between them. Enterprises are not restricted to the home yard but distant fields and common property water sources. Crop fields tend to be shown as boxes which give little indication of the land type. Flows between enterprises and the market concentrate on material outputs and cash only. While men and women are depicted in the diagram we are not shown what they are doing.**

## **Guidelines for Assessing Your First Household Visit**

- *Did the diagram you obtained from the farm family match any of those you saw in the sample series shown here?*
- *Did you see how the diagram from your household visit might be enriched?*
- *What follows are a series questions that will help you assess what you know and what you still have to find out.*
- *Go through these questions, study the answers on page 74 and develop a checklist of what kinds of information you need to gather on your next visit to the household. Remember that the questions refer to the sample diagrams on pages 34 to 40 and not the diagram your household prepared.*

## **Self-Assessment on Diagrams from the First Household Visit**

**2.1. What kinds of diagrams shown in the samples here suggest that we have not allowed farmers to represent their concepts in their own way?**

(mark the box(es) that apply)

- maps of the area
- physical layout of the farm
- many arrows connecting enterprises

**2.2. Why are labor flows ignored in household diagrams?**

(mark the box(es) that apply)

- because actors have not been specified
- because women only do domestic work
- because labor flows are not seen as part of the system

**2.3. What is the most striking difference between the conceptual diagrams shown on pages 10 to 26 and the sample diagram prepared by households on page 40?**

(mark box of the most important one only)

- presence of several houses in the compound
- many more linkages between enterprises
- presence of a square farm boundary

**2.4. Why are linkages important to the conceptual diagrams of farming systems?**

(mark those box(es) that apply)

- because they were drawn by the farmers
- because they indicate relationships between enterprises
- because they make the picture more interesting

**2.5. Fuelwood collection from a nearby government forest and fishing in a bordering river should not be included in a conceptual diagram of a farming system.**

(mark box of your choice)

- true or  false

Turn to page 74 for answers.

## STEP THREE

### FARM HOUSEHOLDS AND GENDER RELATIONSHIPS



**A posture of respect to the household.**



## **Guidelines for Returning to the Household**

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- *Now let's go back to the household and try to improve the household's diagram. Your checklist on this visit should help you get more information on who is doing the work in terms of gender and what is flowing along the arrows in terms of resource flows between enterprises. Concentrate on the major flows of the conceptual farming system. Do not attempt to gather minor flows of what they are doing now.*

- *Return to the same household and courteously introduce yourself and explain your purpose. It is not necessary for you to return to the same household. You should, however, endeavor to visit a household in a similar situation.*

- *Gather the household members together in a central place to elaborate on the diagram they prepared during your first visit.*

- *Use the picture the household drew in your first visit to explore through unstructured questions the biological material and labor flows in the farming system. Concentrate on household member involvement in production and consumption activities including their participation in off-farm activities and the utilization of common property resources. Be sure to highlight gender distinctions in all activities.*

- *What follows are a series of sample diagrams that show how farm households enriched their diagrams with information on the flows between enterprises.*

- *Each diagram has a commentary that highlights areas where our knowledge of gender and farming systems was increased.*

- *Go through these sample diagrams, study the commentary and see how the diagram you obtained from your second visit to the farm household compares.*

## Samples of the Household's Diagram from Your Second Visit

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The son shows his technical knowledge.



Female scientist gathers information from women and children.

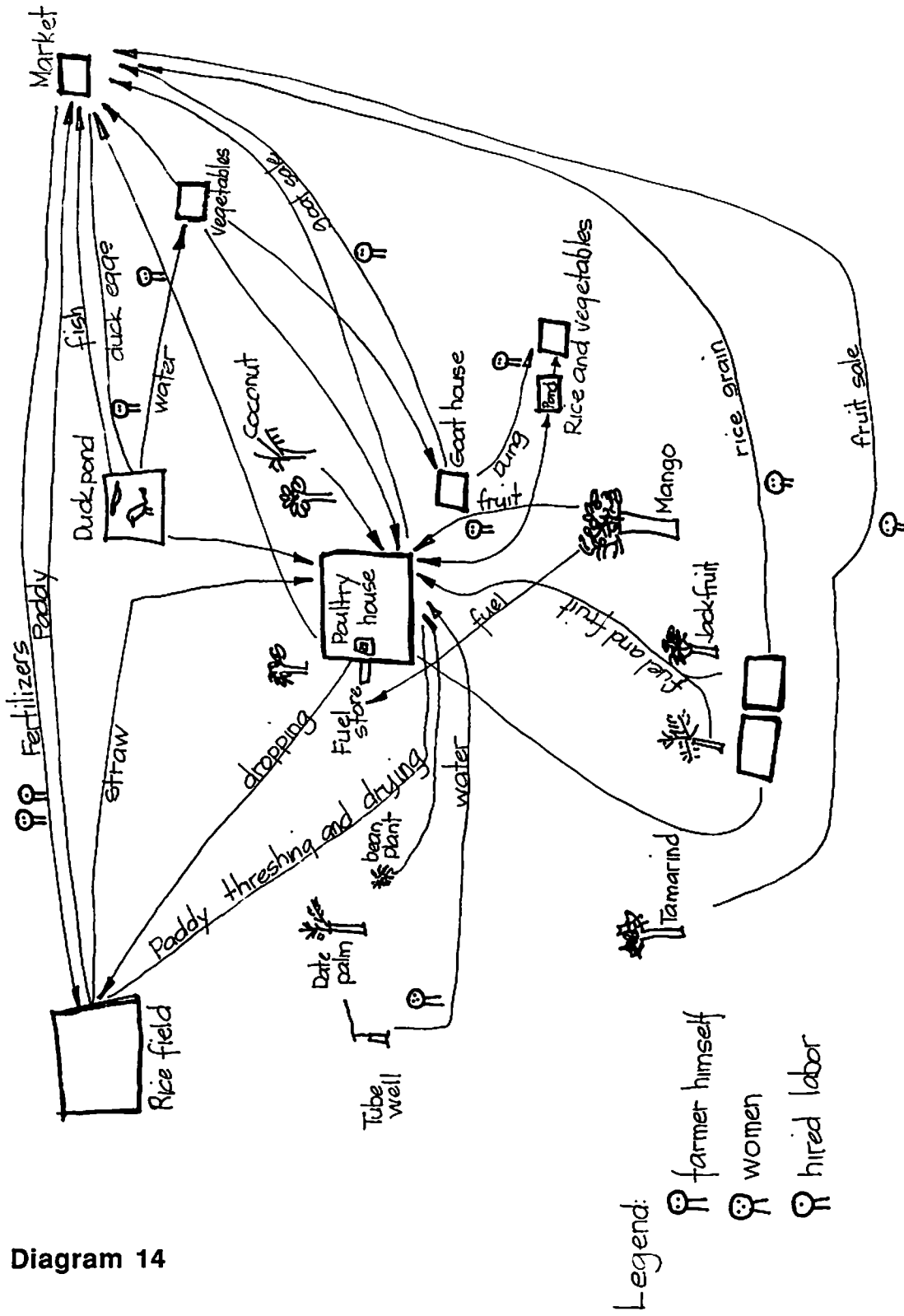


Diagram 14

---

**This diagram specifies whether the linkage between enterprises and the household or market is made by men, women or hired laborers. Few linkages between enterprises and enterprises utilizing common property resources are shown. Boxes to depict the land areas do not suggest the type or quality of the agroecosystem used.**

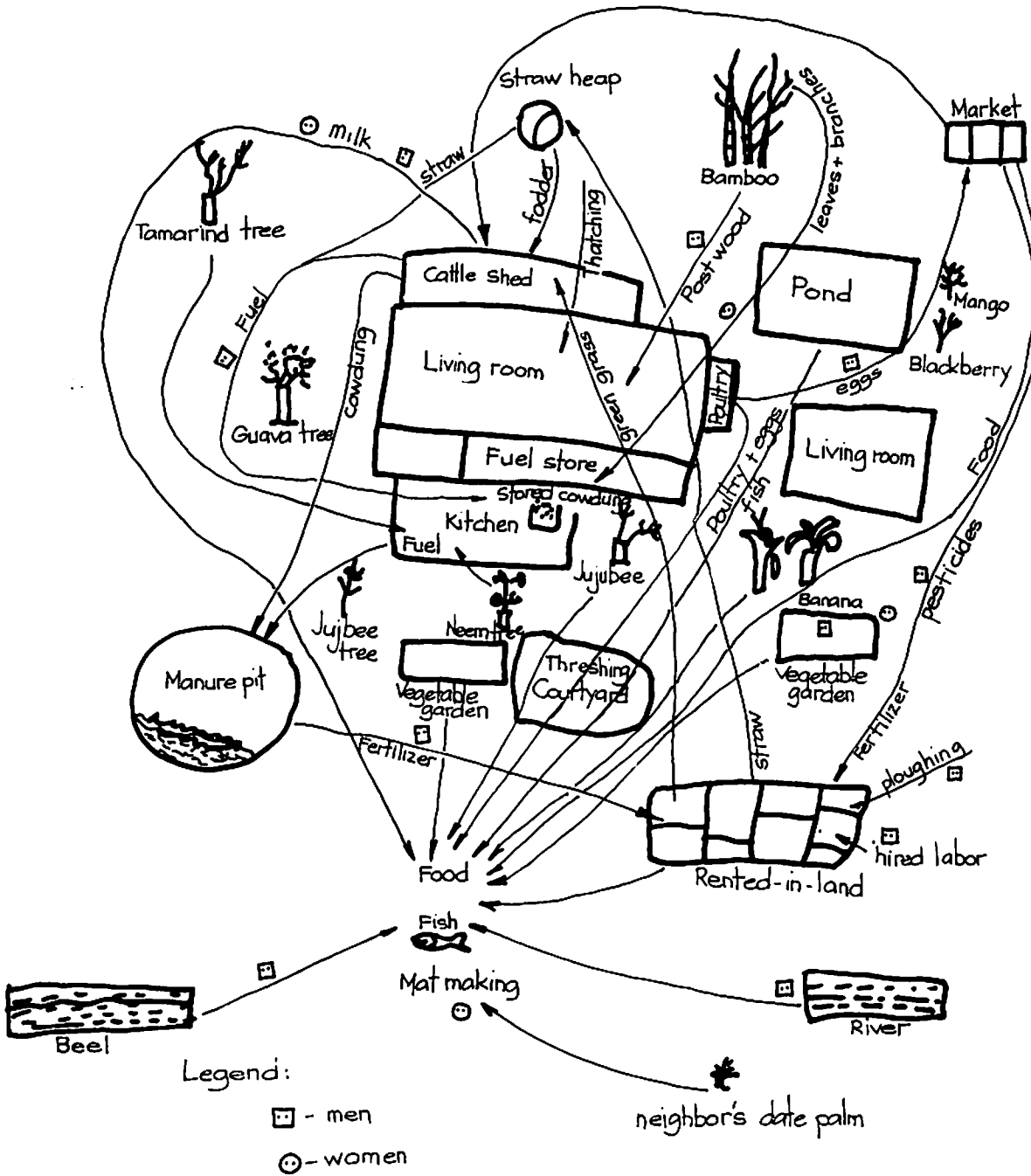


Diagram 15

---

**The diverse set of enterprises depicted here cover non-farm activities, use of common property resources, and off-farm activities. However, who in the extended family, male or female, is doing the work is only shown for some of the activities. This plot layout style for land areas does not suggest the type or quality of the agroecosystem used.**



---

**This diagram shows a wide diversity of enterprises exploiting own and common property resources like the river and grasslands. Linkages off the farm with banks, schools and markets are also shown. For most enterprises the specific persons involved i.e., male, female, children or hired labor are indicated. However the linkages between enterprises indicate flows of biological materials and cash and no gender relationships. Plot layout symbols for crop enterprises give little indication of the type or quality of the land resource being used.**



## **Guidelines for Assessing Your Second Household Visit**

---

- *Is the enriched diagram you obtained from the farm family similar to any of those in the sample series shown here?*
- *Did you see how the diagram from your household visit might be improved?*
- *What follows are a series of questions that will help you assess what you know and what you still have to find out.*
- *Go through these questions, study the answers on page 75 and develop a checklist of what kinds of information you need to gather on your third visit to the household. Remember that the questions here refer to the sample diagrams on pages 48 to 52 and not the diagram your household prepared.*

## **Self-Assessment on Diagrams from the Second Household Visit**

**3.1. Even where women's labor is 'unseen' women can hold responsibility for agricultural tasks.**

(mark box of your choice)

true or  false

**3.2. In addition to technology inputs and cash, what item in the following list is required for households to remain productive?**

(mark the box(es) that apply)

- labor
- fertilizer
- privately owned land
- draft animals

**3.3. Common property resources include**

(mark the box(es) that apply)

- public grazing land
- rivers
- open access forest land

**3.4. Why is it important to identify the gender of the persons working?**

(mark the box(es) that apply)

- because if they are not specified some tasks would remain invisible in the farm system
- because male farmers usually do not talk about the work that female household members do
- because scientists usually talk to male farmers and forget the complexity of the labor process

**3.5. The gender of actors involved in the enterprises and in linkages between enterprises should be specified separately on the arrow and on the symbol because the activities of each are different.**

(mark box of your choice)

true or  false

Turn to page 75 for answers.

## STEP FOUR

# FARM HOUSEHOLDS AND AGROECOSYSTEMS



**Mother makes her input to the model.**

## **Guidelines for the Third Household Visit**

- *Now let's go back to the household for the third time and try to improve their diagram. Your checklist on this third visit focuses on information about the agroecosystem that is being used. Make sure that you observe the micro-environments like ditches, canals, roadsides, homestead gardens and not just the crop fields. On this visit try to see the different agroecosystems being used and assist the family to incorporate this information into their diagram. In many cases this will entail changing a symbol or box into a sketch of the landscape profile.*
- *Return to the household and introduce yourself and your purpose courteously.*
- *Ask the men and women to take you to see the different fields, water sources, and lands areas that they have access to. Use the earlier diagram to identify the various kinds of agroecosystems exploited by the household. Try to see the main types they have shown.*
- *Gather the household members together in a central place and help them redraft their diagram. Remember to include common property resources even if you have not been able to see them.*
- *What follows are a series of sample diagrams that show how the household depicted the agroecosystems used in their farming system.*
- *Each diagram has a commentary that highlights areas where we can broaden our thinking.*
- *Go through these sample diagrams, study the commentaries and see how the diagram you obtained from the farm households compares.*

## **Samples of the Household's Diagram from Your Third Visit**

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**Father makes his input to the model.**



**The young ones are intensely interested.**



---

**The sketches of agroecosystems used in this diagram for water resources used in fishing and land resources used for rice cultivation suggest their type and quality, which is not the case for orchards and homegardens. The large number of relationships linking household activities include those of material flows, cash sales and gender.**

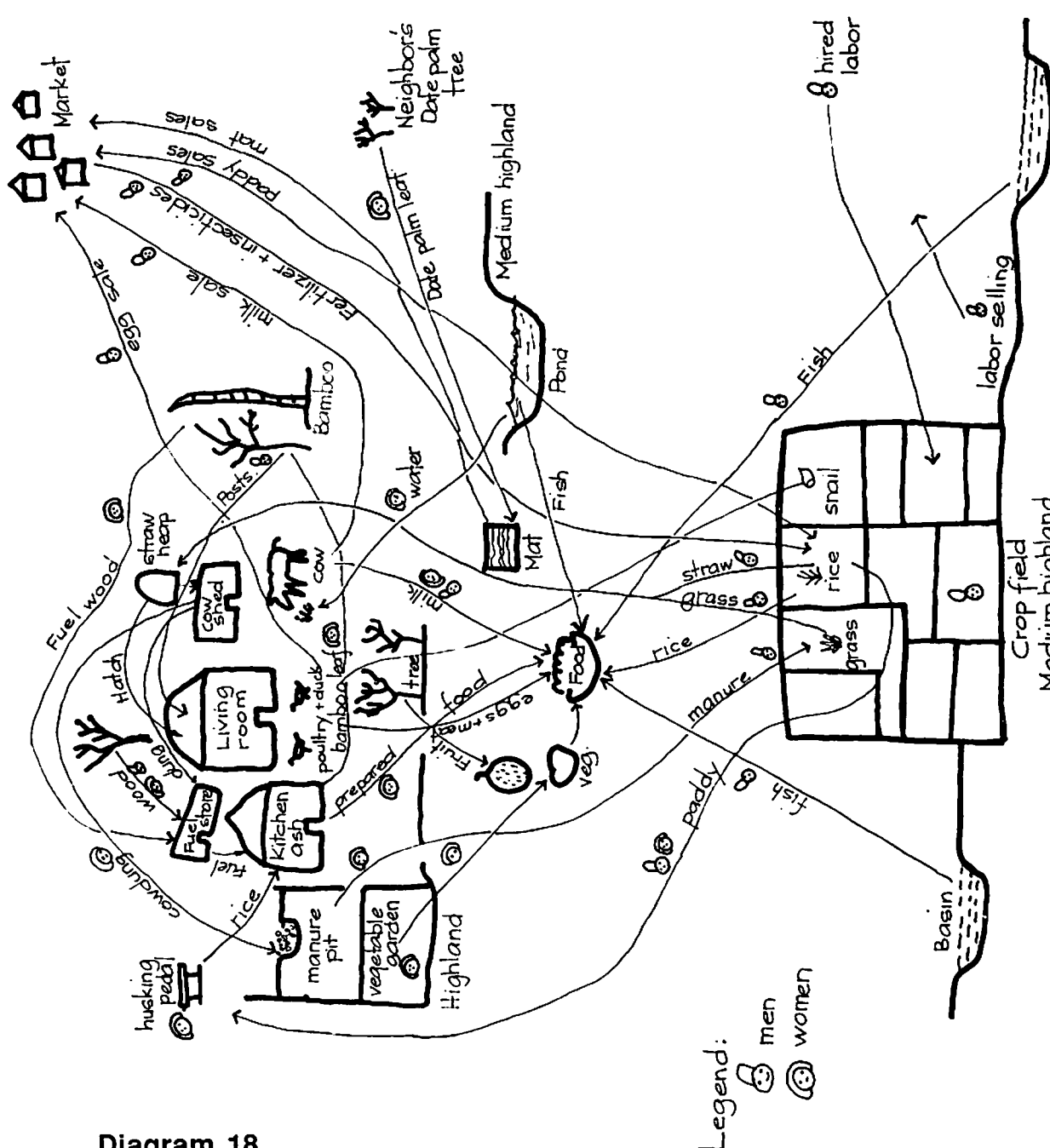


Diagram 18



---

**This diagram which combines land profiles and field plots to depict the agroecosystems used demonstrates how these diagrams can quickly become too confusing when too much information is put into one diagram. With patient study, however, the diagram does reveal a lot about household activities, gender and other relationships between them, and the type and quality of agroecosystems used.**

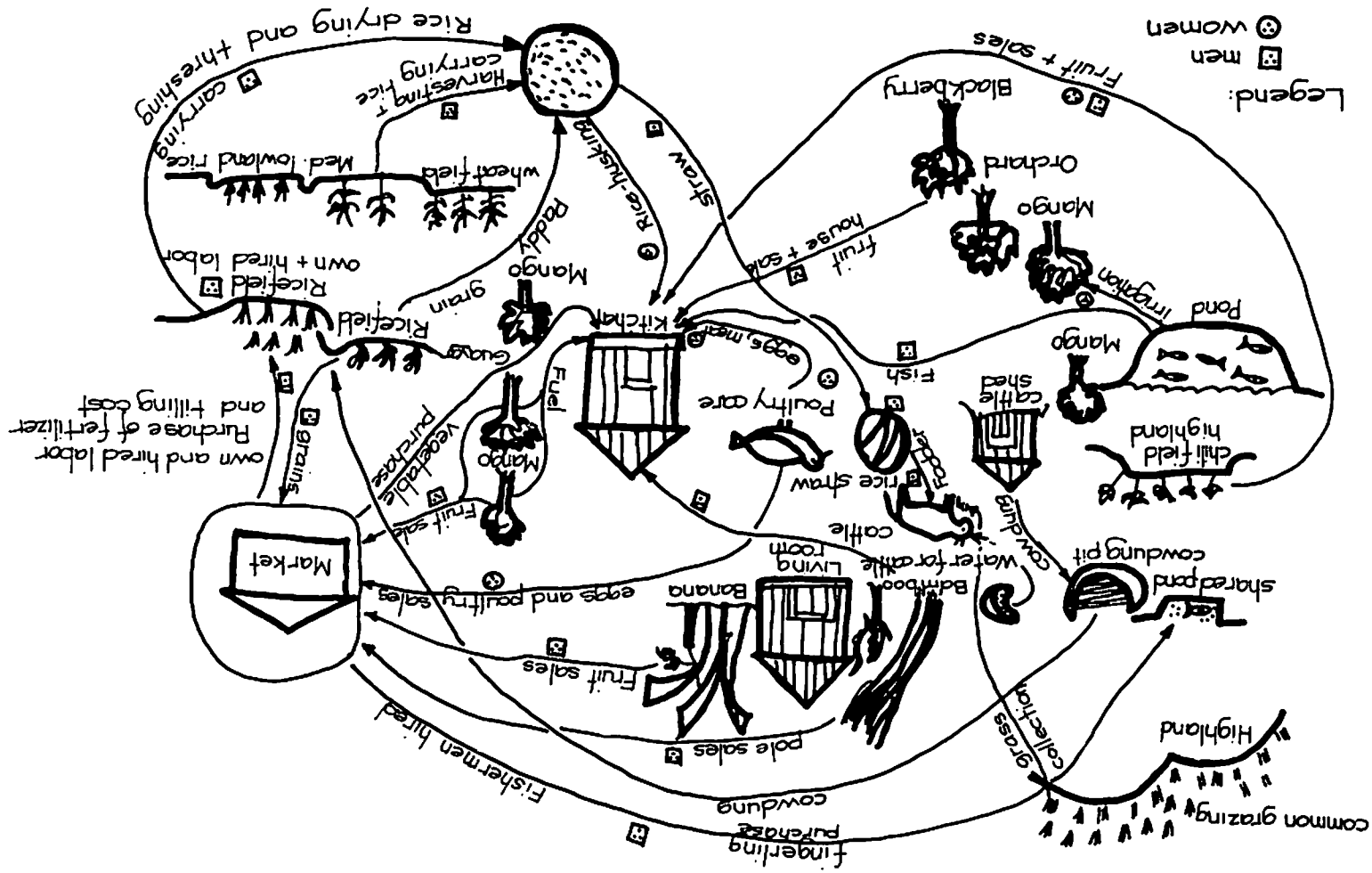


Diagram 19

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**The diagram clearly distinguishes between enterprises and the type and quality of agroecosystems which are exploited. Detailed information is provided about the by-products and wastes that flow between the agroecosystems. Labor relationships are identified by gender and where appropriate by the range of actors, women and men, responsible for the activity. Common property resources for grazing cattle and fishing are clearly shown.**

## **Guidelines for Assessing Your Third Household Visit**

---

- *Is the new diagram you drew with the farm family similar to any of those in the sample series shown here?*
- *What follows are a series of questions that will help you assess what you know and what you still have to find out.*
- *Go through these questions, study the answers on page 76 and decide whether you need to go back to the household for more information. Remember that the questions refer to the sample diagrams on pages 60 to 64 and not the diagram your household prepared.*

## **Self-Assessment on the Diagrams from the Third Household Visit**

**4.1. What style of drawing shows the kind of agroecosystems used?**

(Mark box of your choice)

- boxes with name of enterprise
- symbol of an enterprise
- sketch of the landscape profile

**4.2. What is the most important difference in the way agroecosystems are depicted between this and the drawings made from the second farm visit?**

(mark the box that applies)

- agroecosystems represented by sketch of landscape
- agroecosystems placed in probable geographical location
- agroecosystems shown as a box with enterprise name

**4.3. Agroecosystems of common property resources used by the household that are far away from the homestead should not be included in the conceptual diagram of a farming system?**

(mark box of your choice)

- true or  false

**4.4. Conceptual diagrams of farming systems can become too confused when:**

(mark your choice(es))

- minor relationships between enterprises are included
- several ways to depict an enterprise or agroecosystem are used simultaneously
- the gender of the actors involved is specified

Turn to page 76 for answers.

## WHAT HAVE WE LEARNED?



**A woman-man team of scientists can talk to every household member.**

These exercises have helped show that our usual representation of a farm system does not capture the complex dynamics of rural resource use. The mental picture of agricultural production held by a researcher influences what that person sees on a farm visit and how different attributes of the farm household is represented. These exercises also help us understand the assumptions we bring into our research and extension agenda. It is important to understand these assumptions if we are to recognize the complexities that characterize rural resource management.

Let us recall what our assumptions have been:

- Tending to think of crops and enterprises as separate entities inhibits understanding of farm system interrelationships. It is important to focus on resource flows between enterprises and recognize that these flows sustain the farm and not the individual enterprises.
- Focusing on commodities prevents us from understanding the agroecosystems which are being exploited for their production.
- Concentrating on privately owned resources blinds us to the exploitation of common property resources that sustain household livelihoods.
- Limiting our attention to technical inputs and product flows ignores the labor resources and requirements of the farm system.
- Identifying a single farmer, generally assumed to be a male, ignores the fact that households comprise a diverse set of labor inputs including both male and female, family and non-family members. Highlighting the gender division of labor improves our understanding of the interdependence and often different contributions men and women make to meet production requirements.

Once we have recognized the way in which our view shapes how we understand farming systems and how we devise research and extension programs, we can develop more relevant ways of working, thinking and interpreting information about rural resources management.

More relevant ways of working include:

- Walks through the farm to identify resources and activities for understanding farm systems.
- Diagrams to capture a household's knowledge of how the farming system operates and guide household interviews towards information from men, women and children on the ways in which they participate in rural resource management.
- Unstructured interviewing that invites new information about the resource use strategies households employ.

More accurate interpretation of farming systems include:

- A multiple set of male and female actors are involved in the farm system.
- Activities in the farm system comprise many 'invisible' labor contributions.
- Agricultural commodity production occurs in many different agroecosystems which may or may not be privately owned.
- Labor and other resource exchanges are complementary and interdependent and thus can only be fully understood in relation to themselves and each other.

New ways of thinking include:

- Gender as a concept refers to the relationships between men and women rather than as another term for women.
- Farming systems as activities which may or may not occur on the farm, and relationships among different agroecosystems which may or may not be owned privately, that are exploited for a wide array of enterprises by an individual household.



How do these new ways of thinking, working and interpreting farming systems help improve our current research, and design more relevant interdisciplinary research?

Often improved technologies, especially those involving variety and fertilizer packages, do not perform consistently well across farms. Usually, two or three farmers do very well, a handful perform adequately, but too many perform poorly. Resultant analyses are disappointing for their lack of significant differences. Often we know that the reason for poor performance is because some farmers managed their plots poorly and used infertile, weedy, degraded plots for their experiment. If we had prepared a diagram such as on page 60 we would have known where to locate the experiment. Diagram 17 shows quite clearly the best fields that receive fertilizer and manure and the lower quality field that does not get such inputs or attention. Indeed, even if our job is to improve the performance of one commodity, knowing how it fits in the rest of the farming systems helps us be more effective.

Increasingly commodity-oriented researchers are asked to design interdisciplinary research projects. How, for example, would someone in charge of improving goat production use these conceptual diagrams to design an interdisciplinary research project? Designing an interdisciplinary research effort requires a focus on the arrows between enterprise symbols. The arrows are what bind social and biological scientists through simultaneous indication of labor (women and men), cash and biological relationships. If we examine the arrows concerning goats we see that women feed them with tree leaves and carry goat manure to ricefields and vegetable plots. Men market the goats. These arrows suggest that increased goat production could be affected if goat manure is used for vegetables, rice and fish (if fish are grown in the rice field). Sales of vegetables and fish could finance the needed introduction of fodder trees to improve goat feed, and the purchase of more goats. In this integrated manner herd size and weight could increase. A research effort to do this requires social scientists to examine labor relations between women and men because goat feeding and distribution of manure is done by women and marketing of goats, vegetables and fish is done by men. Economists would have to look at sale of vegetables and fish for purchase of fish fingerlings, trees and more goats. Agroforestry inputs would be needed for the tree leaf production. Horticulturists, aquaculturists and agronomists would be needed for vegetables, fish and rice technologies.

Our simple example concerning goats could have beneficial impact both on households and their environment. The increased sales and purchases hypothesized will add much needed cash and capital to the household economy. Moreover, such additions will afford equitable relations between women and men. The presence of more trees, of fish in ricefields and the flow of manures to the land will rehabilitate agroecosystems. If this guidebook can assist scientists undertake these kinds of experiments, then it will have served its purpose.

# ANSWERS TO THE SELF-ASSESSMENT EXERCISES



**Son helps out his mother in drawing the model.**



**The son transcribes the drawing from the ground to paper.**

## Self-Assessment on our Concepts of Gender and Farming Systems from Page 29

1.1. A farm household is likely to have more than one of its members engaged in agriculture?

(mark box of your choice)

true or  false

1.2. Are women and children productive assets of the household?

(mark box of your choice)

yes or  no

1.3. Who in the farm household can be a farm laborer?

(mark box(es) of those that apply)

- children
- female adult family members
- male adult family members
- hired laborers

1.4. Which of the following agroecosystems may be included in a farming system?

(mark box(es) of those that apply)

- rice paddies
- canals
- rivers
- forests

1.5. Farming systems include off-farm activities?

(mark box of your choice)

true or  false

1.6. What kinds of resources usually flow between enterprises?

(mark box(es) of those that apply)

- labor
- cash
- waste and by-products
- commodities (these are usually but not always consumed or sold)

## Self-Assessment on Diagrams from the First Household Visit from Page 43

2.1. What kinds of diagrams shown in the samples here suggest that we have not allowed farmers to represent their concepts in their own way?

(mark the box(es) that apply)

- maps of the area
- physical layout of the farm
- many arrows connecting enterprises

2.2. Why are labor flows ignored in household diagrams?

(mark the box(es) that apply)

- because actors have not been specified
- because women only do domestic work
- because labor flows are not seen as part of the system

2.3. What is the most striking difference between the conceptual diagrams shown on pages 10 to 26 and the sample diagrams prepared by households on page 40?

(mark box of the most important one only)

- presence of several houses in the compound
- many more linkages between enterprises
- presence of a square farm boundary

2.4. Why are linkages important to the conceptual diagrams of farming systems?

(mark those box(es) that apply)

- because they were drawn by the farmers
- because they indicate relationships between enterprises
- because they make the picture more interesting

2.5. Fuelwood collection from a nearby government forest and fishing in a bordering river should not be included in a conceptual diagram of a farming system

(mark box of your choice)

- true or  false

## **Self-Assessment on the Second Visit Diagram from Page 55**

**3.1. Even where women's labor is 'unseen' women can hold responsibility for agricultural tasks.**

(mark box of your choice)

true or  false

**3.2. In addition to technology inputs and cash, what item in the following list is required for households to remain productive?**

(mark the box(es) that apply)

- labor
- fertilizer
- privately owned land
- draft animals

**3.3. Common property resources include:**

(mark the box(es) that apply)

- public grazing land
- rivers
- open access forest land

**3.4. Why is it important to identify the gender of the persons working?**

(mark the box(es) that apply)

- because if they are not specified some tasks would remain invisible in the farm system
- because male farmers usually do not talk about the work that female household members do
- because scientists usually talk to male farmers and forget the complexity of the labor process

**3.5. The gender of actors involved in the enterprises and in linkages between enterprises should be specified separately on the arrow and on the symbol because the activities of each are different.**

(mark box of your choice)

true or  false

## **Self-Assessment on the Diagram from the Third Visit from Page 67**

**4.1. What style of drawing shows the kind of agroecosystems used?**

(Mark box of your choice)

- boxes with name of enterprise
- symbol of an enterprise
- sketch of the landscape profile

**4.2. What is the most important difference in the way agroecosystems are depicted between this and the drawings made from the second farm visit?**

(mark the box that applies)

- agroecosystems represented by sketch of landscape
- agroecosystems placed in probable geographical location
- agroecosystems shown as a box with enterprise name

**4.3. Agroecosystems of common property resources used by the household that are far away from the homestead should not be included in the conceptual diagram of a farming system?**

(mark box of your choice)

- true or  false

**4.4. Conceptual diagrams of farming systems can become too confused when:**

(mark your choice(s))

- minor relationships between enterprises are included
- several ways to depict an enterprise or agroecosystem are used simultaneously
- the gender of the actors involved is specified

# GLOSSARY OF KEY TERMS



**Will parents hand on a sustainable farming system?**

# GLOSSARY OF KEY TERMS

**Agroforestry** - A collective term for land-use systems and technologies where woody perennials are deliberately used on the same land management unit as agricultural crops and/or animals, either in some form of spatial arrangement or temporal sequence. To qualify as agroforestry, a given land-use system or practice must permit significant economic and ecological interactions between the woody and non-woody components (ICRAF. 1987. *Agroforestry research and development: ICRAF at work*. International Council for Research in Agroforestry, Nairobi, Kenya. *In* McCracken, J.A. and J.N. Pretty. 1988. *Glossary of selected terms in sustainable agriculture*. International Institute for Environment and Development, London).

**Agroecosystems** - An ecological system modified by human beings to produce food, fiber and other agricultural products. Defined by some on purely biophysical characteristics (i.e., an agroecological system) (Hart, R.D. 1984. *Agroecosystem determinants*. *In* Lowrance, R., B.R. Stinner and G.J. House (eds.) *Agricultural Ecosystems: Unifying Concepts*. Wiley-Interscience, New York); others include a socioeconomic component (i.e., an agroecological socioeconomic system) (Conway, G.R. 1987. *The properties of agroecosystems*, *Agricultural Systems* 24:95-117. *In* McCracken, J.A. and J.N. Pretty. 1988. *Glossary of selected terms in sustainable agriculture*. International Institute for Environment and Development, London).

**Appropriate technology** - A generic term for a wide range of technologies characterized by one or several of the following features: low investment cost per workplace, low capital investment cost per unit of output, organizational simplicity, high adaptability to a particular social or cultural environment, sparing use of natural resources, low cost of final product or high potential for employment (Carr, M. 1985. *The AT reader: theory and practice in appropriate technology*. Intermediate Technology Publications Ltd., London. *In* McCracken, J.A. and J.N. Pretty. 1988. *Glossary of selected terms in sustainable agriculture*. International Institute for Environment and Development, London).

**Common property resources** - Resources collectively owned and managed by a well-defined group of users. Irrigation systems and upland pastures are common examples. Ideally, common property resources are governed by a common property regime (i.e., a system of rights and duties) which prevents overexploitation. Many traditional societies have institutional arrangements to manage common resources in a sustainable manner. But in the face of rapid population growth and poverty, many common property resource management institutions have broken down. The result may be that common property resources are converted to open access resources. (National Research Council. 1986. *Common property resource management*. National Academy Press, Washington D.C.).

**Enterprises** - Activities undertaken to produce an output that contributes to total production or income of the farm family. Enterprises in FSR & D



typically concern crops, livestock, processing or otherwise upgrading agricultural commodities produced on the farm, productive nonagricultural activities carried out on the farm such as handicrafts, and productive off-farm activities of the household members (Shaner, W.W., P.F. Philipp and W.R. Schmehl. 1982. Farming systems research and development: guidelines for developing countries. Westview Press, Boulder, Colorado.)

**Farming systems** - A unique and reasonably stable arrangement of farming enterprises that the household manages according to well-defined practices in response to the physical, biological, and socioeconomic environments and in accordance with the household's goals, preferences and resources. These factors combine to influence output and production methods. More commonality is found within the system than between systems. The farming system is part of larger systems - e.g., the local community - and can be divided into subsystems - e.g., cropping systems. (Harwood, R.R. 1979. Small farm development: understanding and improving farming systems in the humid tropics. Westview Press, Boulder, Colorado. *In* McCracken, J.A. and J.N. Pretty. 1988. Glossary of selected terms in sustainable agriculture. International Institute for Environment and Development, London).

**Gender and Sex** - Sex differences refer to socially agreed upon biological criteria for classifying persons as females or males. Biological criteria include anatomy, hormones and physiology. Gender, in contrast, refers to the social construction of differences between female and male, and between feminine and masculine. The social construction of gender is based on how different structural arrangements shape the normative conceptions, attitudes and activities appropriate for females and males. In this definition, gender refers to the complex relationship between biological and cultural processes which change over time and across different places. (Abstracted from West, Candace and Don H. Zimmerman, "Doing Gender." *In* The Social Construction of Gender, Judith Lorber and Susan A. Farrel. California: Sage Publications.)

**Household** - A social organization in which members normally live and sleep in the same place and share their meals. They may or may not be a joint family. A joint family is one consisting of two or more lineally related kinfolk, their spouses and offspring. Women may be heads of households in various ways, as 1) recognized heads of households such as when they are widowed or divorced, 2) acting heads such as when their husbands are away for extended periods, or 3) informal heads such as when they have command over resources and make decisions on their own initiative. Even when they are not heads of households, women usually have a recognized and important role through their contribution of labor, management, marketing and ownership of resources. At times, individuality among males and females leads to competition within the households as when husbands sell firewood to their wives and husbands lend each other money with interest. (*In* Shaner, W.W., P.F. Philipp and W.R. Schmehl. Farming systems research and development: guidelines for developing countries. Westview Press, Boulder, Colorado).

**Non-farm activities** - Activities that households engage in on their farms that are not related to farming. Typical activities include trade, wage and in-kind

are not related to farming. Typical activities include trade, wage and in-kind exchanges. Informal activities like tailoring, pot making, weaving, carpentry, rope making and basket making are also considered.

**Off-farm activities** - Activities that households engaged in that occur off their farm. These activities may be related to farming, i.e., agricultural wages, share cropping and in-kind exchanges of agricultural commodities and the exploitation of common property water, grassland and forest resources.

**Open access resources** - Sometimes referred to as non-property resources, are any natural resource that does not have a barrier or obstacle to its use or exploitation. Examples of open access resources are fisheries, the ocean, certain freshwater sources, and, in the absence of regulation or control, many upland forest resources. Because these are available free or at minimal cost, they are frequently overpopulated leading to degradation, pollution or exhaustion (Halfele, E.T. 1974. *The governance of common property resources*. John Hopkins University Press for Resources for the Future).

**Subsistence agriculture** - Farming systems in which a high proportion of final production is consumed by the producers. Pure subsistence displays the total absence of any production for cash or exchange and is not common - most modern subsistence systems involve the production of some cash crop or livestock for sale although the ratio of subsistence to cash production may be highly variable from year to year. Subsistence farming is generally dependent on crop raising; livestock rearing, although usually present, is rarely of greater significance than cropping. (Johnston, R.J. et al. (eds.) 1986. *The dictionary of human geography*. Second edition. Blackwell, Oxford, England; Wharton, C.R. 1969. *Subsistence agriculture and economic development*. Aldine, Chicago. Westview Press, London. *In* McCracken, J.A. and J.N. Pretty. 1988. *Glossary of selected terms in sustainable agriculture*. International Institute for Environment and Development, London).

#### **ABOUT THE AUTHORS**

**Dr. Clive Lightfoot** is Senior Scientist in integrated aquaculture-agriculture farming systems research at the International Center for Living Aquatic Resources Management, Manila, Philippines.

**Dr. Shelley Feldman** is Assistant Professor of Rural Sociology and Coordinator of the Program on International Development and Women, Cornell University, NY, Ithaca, USA.

**Dr. M. Zainul Abedin** is Chief Scientific Officer and Head of the On-Farm Research Division of the Bangladesh Agricultural Research Institute, Joydebpur, Bangladesh. He currently holds a research fellowship with the International Council for Research in Agroforestry, Nairobi, Kenya.

**Households, agroecosystems and rural resources management.** A guidebook for broadening the concepts of gender and farming systems. C. Lightfoot, S. Feldman and M. Zainul Abedin. 1991. Reprinted 1995. ICLARM Educ. Ser. 12, 80 p. US\$3.50; \$5.50 airmail, P65.

## TITLES OF RELATED INTEREST

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**Integrated agriculture-aquaculture farming systems.** R.S.V. Pullin and Z.H. Shehadeh, Editors. 1980. Reprinted 1984, 1986. ICLARM Conf. Proc. 4, 258 p. Out of print - available in photocopied form at US\$38.70, inclusive of airmail cost.

**Aquaculture research and development in rural Africa.** B.A. Costa-Pierce, C. Lightfoot, K. Ruddle and R.S.V. Pullin, Editors. 1991. ICLARM Conf. Proc. 27, 52 p. US\$3.50 surface, \$5.00 airmail.

**Research and education for the development of integrated crop-livestock-fish farming systems in the tropics.** P. Edwards, R.S.V. Pullin and J.A. Gartner. 1988. ICLARM Stud. Rev. 16, 53 p. US\$3.50 surface, \$6 airmail, P60.

**The ICLARM-CLSU integrated animal-fish farming project: final report.** K.D. Hopkins and E.M. Cruz. 1982. ICLARM Tech. Rep. 5, 96 p. US\$7.75 surface, \$14.85 airmail. Out of print - available in photocopied form at US\$14.40, inclusive of airmail cost.

**Training resource book on a participatory method for modelling bioresource flows.** C. Lightfoot, R. Noble and R. Morales. 1991. ICLARM Educ. Ser. 14, 30 p. US\$3:00 including airmail delivery. Available with Videos 1 and 2 in English in color in VHS and Beta formats. Price: VHS, US\$40 including airmail delivery. Beta, P2,000. A superior VHS-NTSC edition is available at \$90.

**The context of small-scale integrated agriculture-aquaculture systems in Africa: a case study of Malaŵi.** ICLARM and GTZ. 1991. ICLARM Stud. Rev. 18, 302 p. US\$13.50 surface, \$32.00 airmail, P300.00.

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