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Farmer participatory research on coconut diversity: workshop report on methods and field protocols

Pablo B. Eyzaguirre and Pons Batugal (editors)

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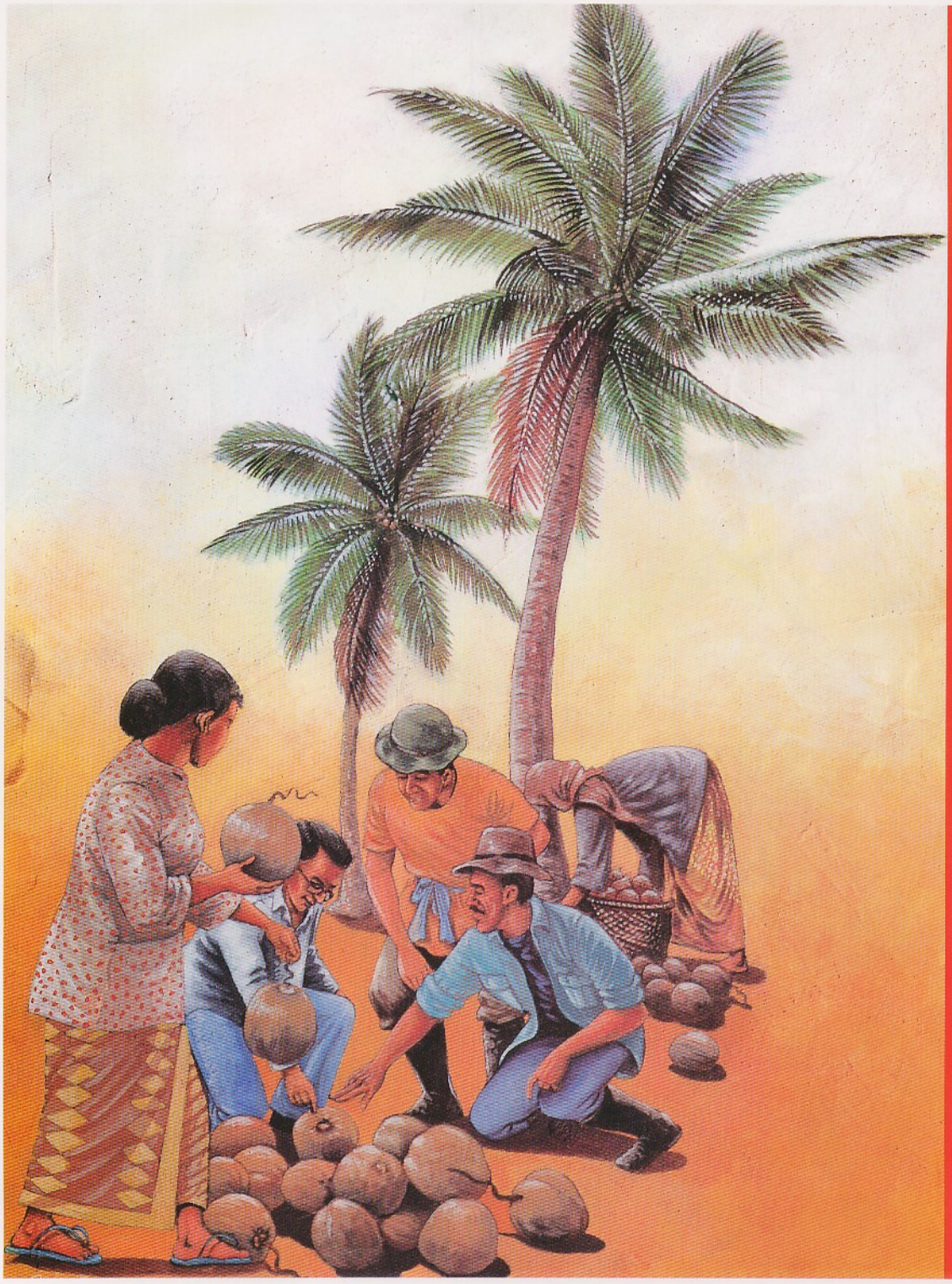

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Financial support for the Research Agenda of IPGRI is provided by the Governments of Australia, Austria, Belgium, Brazil, Bulgaria, Canada, China, Croatia, Cyprus, Czech Republic, Denmark, Estonia, F.R. Yugoslavia (Serbia and Montenegro), Finland, France, Germany, Greece, Hungary, Iceland, India, Ireland, Israel, Italy, Japan, Republic of Korea, Latvia, Lithuania, Luxembourg, Malta, Mexico, Monaco, the Netherlands, Norway, Pakistan, the Philippines, Poland, Portugal, Romania, Slovakia, Slovenia, South Africa, Spain, Sweden, Switzerland, Thailand, Turkey, the UK, the USA and by the Asian Development Bank, Common Fund for Commodities, Technical Centre for Agricultural and Rural Cooperation (CTA), European Union, Food and Agriculture Organization of the United Nations (FAO), International Development Research Centre (IDRC), International Fund for Agricultural Development (IFAD), International Association for the promotion of cooperation with scientists from the New Independent States of the former Soviet Union (INTAS), Interamerican Development Bank, United Nations Development Programme (UNDP), United Nations Environment Programme (UNEP) and the World Bank.

Citation: Eyzaguirre, P.B. and Pons Batugal (editors). 1999. Farmer Participatory Research on Coconut Diversity: workshop report on methods and field protocols.

Front cover: Zaim Darulaman

ISBN: 92-9043-430-9

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Contents

Acknowledgement and foreword

The contents of this report include the presentations, discussions and protocols produced at the Workshop on Farmer Participatory Research on Coconut Diversity held in both Davao, Philippines, 16 – 28 March 1998 and in Taveuni, Fiji, 24 – 28 March 1998. Two smaller follow up workshops were held in the Solomons and in Bangladesh, the results of which are also included. This volume provides documentation of a work in progress. It is intended as a reference for coconut scientists and development specialists in carrying out participatory field research with farmers. The contributors and participants welcome feedback and dialogue on approaches to foster greater participation of farmers in coconut research and conservation and greater recognition by scientists and development workers of the rich fund of knowledge on coconut diversity maintained by small-scale farmers.

We are grateful to the participants, organizers and resource persons for the timely and useful contributions summarized and presented in this field notebook. The workshops were funded by the International Fund for Agricultural Development (IFAD) under the collaborative IPGRI-COGENT-IFAD project on "Sustainable uses of coconut genetic resources to enhance incomes and nutrition of smallholders in the Asia-Pacific region".

The Philippine Coconut Authority (PCA) and the staff of the PCA's Davao Research and Training Extension Center in the Philippines provided a productive and friendly environment for sharing and learning from experiences, and methods for participatory research on coconut diversity. Special thanks to Mr Romero Blancaver, Mr Edgar Bahala, and Mr Carlos Carpio. The assistance and contribution made by the staff of the Taveuni Coconut Centre, Fiji, ensured a smooth transfer of valuable information throughout the workshop. We give special thanks to Mr Tevite Kete and Mr Semi Moceciri of the Ministry of Agriculture, Fisheries and Forest (MAFF).

We also thank the team that produced this volume. Compilation of this report was done by Nicky O'Neill and Amanda King of IPGRI, Rome, Italy. Final editing and layout was done by Shalizahanim Shukor of IPGRI, Regional Office for Asia Pacific and Oceania. We hope this volume will stimulate similar efforts to tap local knowledge of coconut diversity to solve the problems of small-scale coconut farmers.

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October 1999

Introduction

Farmer's contribution to improving the value and uses of coconut through the maintenance and use of genetic diversity

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Coconut diversity in the hands of farmers and formal coconut research

Farmers who grow coconut are deeply attached to the various products and services of the coconut palm. When they move into areas that are far from optimal for the growing of coconut, they take coconut with them, creating and maintaining microenvironments which allow it to survive. Over time, farmers have contributed to the adaptation of coconut to a range of specific environments by moving and growing coconut even in areas and environments which are marginal to coconut production, namely: high elevations, higher latitudes, drought prone areas, areas subject to heavy winds and a range of soils from atolls to heavy clay soils. This specific adaptation under farmer management deserves to be understood and supported. Given the high degree of diversity in these populations, many useful genetic traits for resistance and adaptation have been developed and are being maintained by farmers.

It is recognized that formal coconut research has been a recent and under-resourced effort in relation to the distribution and value of the crop, and the complexity of coconut crop improvement (Persley 1992). Some significant achievements have been made by coconut breeders with the release of dwarf hybrids which have higher yields of copra and oil. Where the copra industry is well organized and efficient, these hybrids have made a positive contribution to coconut productivity and to incomes of coconut farmers. However, many if not most smallholders growing coconut are not well served by industrial copra collecting, marketing and processing infrastructures. The research on coconut as an oilseed has yet to reach the bulk of the coconut producers who are smallholders. This gap may be due to the multiple uses of coconut and the diverse farming systems where it is grown. Narrowing the gap may require a new approach that brings farmers, breeders and genetic resource scientists together to define a wider range of uses for coconut diversity from the genetic level to the final products that reach the consumer.

Coconut diversity and its multiple uses by smallholders

The uses and value of coconut palms to smallholders are far greater than copra and oil. While global and national statistics on coconut production measure yield only in terms of oil and copra, whereas most coconut research and development has historically been classified as work to improve the productivity of oilseeds, this may not be the way smallholders view the coconut palm. As yet there are few studies which calculate the total value of coconut production by including products other than oil and copra. Where such studies exist, more work is needed so that the results can be used as reference for agricultural statistics, policy and the strategies for coconut research and development. Because many small farmers value coconut palms in a different way from the primary values assigned by formal R&D and national agricultural policy, they remain attached to types of coconut populations which are different from the improved cultivars. In cases where higher yielding coconut varieties are available and supported by

development schemes, there is widespread evidence that many farmers continue to prefer their local cultivars. The local cultivars they prefer are tall, with a high degree of diversity within populations, and provide a wide range of products for a long time with minimal inputs and labour.

Social scientists have traditionally been called in to explain to the breeders why farmers are not adopting an improved variety. My focus however is different. The focus of this paper is to call for a better understanding of what diversity farmers are maintaining and managing, and how this diversity within and between populations of coconuts can be used by both farmer and researcher to improve the value and productivity of coconut across a range of products and uses.

Improving a multi-purpose smallholder tree crop

If we are to improve the competitiveness of coconut by broadening the use of genetic diversity to increase the value of coconut products beyond copra, some questions need to be raised. Has the near total focus by coconut breeding programmes on oilseed productivity, led to a narrower evaluation and use of coconut genetic resources, and as a result a narrower range of genetic diversity, located, identified, and conserved? From the perspective of the anthropologist concerned with local user's perspective, I would suggest that this is so. Small farmers have a much broader set of useful characters which they value and maintain in their coconut populations. Hence their preference for the tall, polymorphic coconut varieties with a high degree of genetic diversity within populations.

A close partnership between scientist and coconut farmers is needed to identify and use the genetic diversity that exists to maximize the productivity of coconut palms for a wide array of products. Farmers' expertise on characteristics and adaptation of coconut populations for multiple uses is a vital resource to be maintained along with the diverse populations which can provide the genetic basis upon which future multi-purpose coconut improvement will depend. Scientists and farmers together will need to define the goals of coconut research and development. A lack of understanding of the large amount of morphological variation due to the interaction of genotype and environment has in the past led to unrealistic expectations for yield improvement in coconut (Foale 1991).

Where multi-purpose crops are concerned, there will be choices and trade-offs in any improvement programme. Key strategic objectives are whether to use the genetic diversity to select and develop several specific varieties for other uses such as fibre, food, fruit, drink, wood and timber. Alternatively, researchers can work with farmers to conserve and enhance the existing locally adapted populations while retaining the diversity within populations that enable coconut farmers to provide multiple products. The local varieties may not be high yielding along a single criterion such as oil, but when other uses are included and pest resistance is enhanced they may be more productive overall. This paper does not purport to answer a question that is best answered in consultation between coconut researchers and coconut farmers. However, there is the question of the time and cost of producing a new certified variety in coconut, and the fact that smallholders are likely to retain a preference for a cultivar that is low maintenance and provides a stable yield across a number of characters. It may be unfair to expect the existing infrastructure for coconut research to focus on varietal development for so many diverse objectives and environments. What is feasible and urgent, however, is for researchers to work with farmers to understand better the local coconut populations which they maintain and the link between that diversity and the range of products and uses of coconut.

Adding value to coconut diversity in small scale farming systems.

There are two levels of diversity in coconut. One is diversity between populations resulting from human and natural selection in different environments. This is the source of much of the diversity we still need to understand and conserve for improving the adaptability and pest and disease resistance of coconut. The other is the diversity found within outcrossing populations. All populations of tall varieties fall into this category of allogamous populations with high levels of diversity (Foale 1991). Given the preponderance of tall coconut palms in small-scale, low-input farming systems distributed across a wide range of environments, and the fact that hybrids are predominant in commercial copra production systems in the more favourable areas, it is fair to say that small farmers maintain the greatest amount of genetic diversity in coconut.

Breeding objectives, farmer-based characterization and genetic resources

Breeding objectives have been largely focused on the oilseed, improving the oil and copra yield of the nuts. Other more specific objectives are still focused on the nut, and include improving the protein content, the quality of the fatty acids and other properties of coconut oil and fat (Santos & Sangaré 1991). Not surprisingly, the breeding objectives have influenced the evaluation and maintenance of coconut germplasm by formal institutions concerned with coconut research and development. Coconut research centres have access to a very small fraction of the variability that exists within the species (de Nuce 1991). Much of the diversity, which is not accessible to coconut researchers, is in the hands of small farmers in diverse environments growing coconuts for many varied uses.

This pool of coconut diversity and knowledge of coconut uses and local varieties presents an important opportunity if coconut improvement is indeed to be based on a partnership with coconut producers who are in the main small farmers. It also presents an opportunity to maintain and use the great diversity that exists in coconut populations distributed worldwide in a range of environments. Given the costs in time and resources of coconut germplasm evaluations, working with farmers to assess the characteristic of local coconut populations across a set of key criteria would be a useful first step to sample and identify a broader range of diversity in coconut. This should make an important contribution to both conserving existing diversity and expanding the genetic base of coconut improvement.

Partnership between coconut researchers and farmers is essential at an early stage to define breeding objectives, conservation needs, and potential for genetic enhancement of coconut varieties in low input systems. Objectives for coconut genetic resources conservation, use and improvement will certainly need to reflect the uses of coconut. In this particular case the question is not so much one use versus another. Rather, it concerns the definition of primary use, and whether varietal improvement aimed at a primary use, copra for example, will limit the identification and use of a wider range of genetic diversity.

Farmers already have existing, indigenous systems of characterization and evaluation of coconut. Their system is primarily based on the various uses of coconut. Since our strategy for coconut improvement will depend on improving its adaptability as well as its productivity and marketability across a wider range of products, farmer-based classification and evaluation of coconut populations is particularly useful. Table 1 describes the more important areas where farmer evaluation of coconut diversity can serve as a first step to the identification and use of diversity for coconut improvement as a multi-purpose crop.

At this stage, coconut production systems are threatened and along with it the livelihoods of millions of farmers with few alternatives. Research and development could aim at the generation of a several new coconut varieties, each aimed at a single product, wood, fresh fruit, drink, fibre etc. in the hopes of increasing the marketability and value of the specific coconut product. Given the time it would take and the current threats to coconut populations and coconut producers would mean that many areas of coconut production might be lost with its attendant genetic diversity. Incomes for millions would continue to erode along with the genetic diversity. Some of the genetic diversity that could provide the basis for future coconut improvement would also be lost. In light of this scenario, a strategy aimed at identifying and enhancing the genetic resources in locally adapted populations of tall coconut varieties may be the first step. Breeders would have the opportunity to identify adaptive traits and resistance to pests and diseases which could be used in coconut improvement. Farmers might be in a position to receive technical support and develop new markets and post-harvest opportunities for diverse coconut products in local industries in the short term. In the longer term the commercial value and export potential of non-oil and copra products is barely tapped.

Farmer participatory approaches to coconut genetic diversity might contribute to several objectives, with high rates of return. One is to develop locally adapted varieties that are able to perform in less favoured environments with few inputs and low levels of husbandry (Persley 1992). Another is to identify uses and techniques to exploit and derive greater value from a wider range of coconut palm products. Farmers are the experts in the multiple uses of coconut palms. Only a few of these are exploited commercially in any single coconut growing region, with the exception of South Asian countries which have truly seen a remarkable expansion of coconut products for the home markets. In most cases, for this to occur, the development of harvesting, and post-harvest processing techniques will have to be oriented to a supply of raw materials that comes from many small-scale farmers.

The ideal coconut palm for these diversified coconut industries will be a multi-purpose tree that retains many of the characteristics of the tall and locally adapted coconut varieties that predominate on small farms. The basis of restoring the productivity of smallholder coconut should begin with an understanding of the value and diversity of coconut populations managed by small farmers. Given the relatively modest investment in coconut research and the vast fund of diversity that remains to be explored, identified and used, the scope for dramatic improvements resulting from a participatory effort is great.

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Table 1. Characteristics for farmer participatory evaluation of coconut palm diversity

Yield & adaptation to specific environments

- Disease resistance
- Pest resistance
- Extremes of altitude, climate, insolation, and winds
- Soil types
- Use in micro-environments
- Morphology and architecture

Different products

- Fruit and milk production & quality,
- Fibre production & quality,
- Leaf production,
- Oil production & quality
- Wood production: quality and density

Local coconut husbandry and processing techniques

- Planting in micro-environments
- Harvesting techniques for various products
- Frequency of harvesting and parts of the palm used
- Gender specialization and gender-based knowledge
- Exchange of coconut germplasm and sources of new germplasm

Farmer participatory methods for coconut genetic resources in Asia – Pacific region

Tools for participatory research on crop and tree diversity

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Farming is a multi-faceted activity that involves economic, biological, social, and land-management decision-making. Farmers play an essential role in shaping the diversity of their crops through this process of decision-making. Their values and needs are reflected in the selection and maintenance of crops with specific and useful agromorphological traits and adaptive characteristics. Because farmers are the repository of all the information and experience which inform their individual patterns of crop-management, the study of crop diversity must involve research on farmer knowledge. Participatory research involves working directly with farmers to elicit their knowledge in order to understand the social variables which shape on-farm crop diversity. This type of research should not be an extractive exercise, but a cooperative, reciprocal, and beneficial process for both researchers and participants.

Participatory methodologies incorporate the perspectives of multiple actors whose ideas, interests and identities shape the practice of farming in a given agroecosystem. In addition to the need to understand the basis for farmer decision-making and management of diversity, additional reasons for the use of participatory methodologies in research on genetic diversity are to:

- improve the functional efficiency, efficacy, and appropriateness of formal research;
- empower marginalized people and groups so that their own decision-making, research capacity, and ability to make effective demands on research and extension is strengthened;
- gain a better understanding of methods to ensure that different stakeholders' interests are heard and considered equally;
- create guidelines for varied circumstances, such as differences in cultural or regional contexts or in the nature of the research problem; and
- reach an understanding of how addressing the needs of particular groups may have impacts or benefits for wider groups.[1]

There are two important questions to be asked in the process of developing participatory methodologies:

- What type of participation is involved?
  Answering this question requires a decision as to whether participation is on a nominal or consultative basis alone, or whether participants will also be involved in the design of the research, the research process, and the deployment of research results.

[1] Adapted from *Hilary Feldstein* in (1996) CGIAR Gender Program, New Frontiers in Participatory Research and Gender Analysis, Systemwide Programme on Participatory Research and Gender Analysis for Technology and Institutional Innovation, P.76.

- How is the participatory process managed?
  This involves determining what are the goals of the research, who is participating, in what context participation occurs, and what are the criteria for success.

Identifying stakeholders in participatory research

Stakeholders include all those who might help shape the research agenda, who are directly involved in carrying out research, or who are going to be affected by, or use, the results of the research at different stages. Some of these are evident while some will require greater effort to identify. Certain factors to consider include:

- degree of stakeholder differentiation; and
- methods and mechanisms for identifying stakeholders and hidden stakeholders: there are categories of people who share certain characteristics; and there are groups of people which are organized around a particular resource or set of tasks, or an institution, such as kinship or work groups.

Who participates? Gender and other variables

- Are the participants of the research process representatives of the population or of the end users, and why is representativity relevant for the goals of the participatory process?
- Do participants bring relevant expertise to the process?

Answering these questions is the first step in developing a participatory methodology. The issues of representativity and specialist knowledge make the application of gender analysis an essential part of any participatory process.[2] Gender analysis allows the specialized domain of knowledge related to gender-differentiated roles and responsibilities to be assessed and utilized toward the goals of all those involved in the research. The focus on gender should not be understood as denying class, ethnicity, or other important variables that differentiate the users of agricultural research outputs. However, an explicit focus on gender and the application of gender analysis, frequently helps to reveal the sources of variation that may be of importance.

There have been a number of constraints on the inclusion of women and other marginalized groups in participatory research. Some of these include the fact that women are often not included in the public domain, they may not identify with research questions, they may not be allowed to speak to male researchers, or they may be hindered by time constraints which do not allow them to participate in research activities. Because of these constraints, it is important that the following steps become part of the methodology development:

- identify distinct and relevant stakeholders or users;
- find ways to ensure that each category or group is part of the process of articulating its knowledge and priorities as well as collaborating on design and assessment, if it is a relevant stakeholder in the issue in question;
- determine priorities and facilitate negotiations between stakeholders; and
- measure the contribution made by including stakeholders in research outcomes.

[2] See *Jaqueline Ashby* in (1996) CGIAR Gender Program, New Frontiers in Participatory Research and Gender Analysis, P.20.

Gender analysis

Evidence from previous research has indicated that for forestry species, the gendered division of labour and knowledge is of great importance in determining crop uses and management. While the boundaries that distinguish men's from women's responsibilities are often more dynamic with respect to other agricultural crops, for various reasons the uses and care for tree species tend to have clearly defined, separate use and management patterns based on gender. Therefore, participatory methodologies for research on forestry species must include gender analysis in order to present an accurate picture of the social factors that shape diversity.

There are a number of ways in which gender-specific information can be elicited in participatory research. These tools may also be applied to other types of groups whose knowledge and needs are marginalized within larger groups. Gender analysis focuses on three sets of questions: Who does what, when, and where? Who has access to or control over resources for production? Who benefits from each enterprise? Some answers to the following questions may be gathered using the following research practices.

- Interviews or exercises conducted separately for men's and women's groups: maps, transepts, matrices, life histories, focus or community interviews, wealth ranking, venn diagramming, etc. Results of the separate exercises can then be compared to identify areas of both common and different knowledge or interests.
- Separate trials and field days to test technology options and discuss results.
- Researchers engage in participant observation in places where women work and where tasks are done by women.
- Female researchers, field assistants, and enumerators are included on the research team.
- In joint or separate meetings, questions are asked about tasks or enterprises which are known to be in the women's domain.
- Researchers collaborate with pre-existing women's groups.
- Researchers work with NGO partners which have access to women's groups.[3]

Developing a sampling procedure

An important initial consideration for the collection of socio-cultural data and farmer knowledge is the level of aggregation and the units of analysis to be used. While the "household" is often used as a key point of reference, the definition of household varies according to cultural context. In order to use the household as a basic unit of research, it is necessary to clearly define what is meant by a "household" in a particular community, and to analyze it as both a productive and social unit.

Another consideration is that the use of the "household" as a unit of analysis may hide disparities of knowledge, experience, and power among individuals. In order for all types of community knowledge to be represented in participatory research, it is necessary to look at both inter-household and intra-household variables. Household crop production and farmer decision-making may be influenced by inter-household factors such as the land tenure system or the size of land holdings. In addition, crop management may be shaped by factors within the household such as differential access to inputs, responsibility, and control over products. Because coconut use and management patterns differ strongly according to gender, conducting research with one member of the household may reveal only one aspect of coconut production. In order to capture information about responsibility and ownership, as well as differences in use-patterns and value systems, it is necessary to collect data at both the individual

[3] Adapted from *Hillary Feldstein*, New Frontiers in Participatory Research and Gender Analysis.

as well as the household level. In addition, the concurrent use of gender-analysis will help to reveal differences in management decisions, responsibilities, and values that may otherwise remain hidden.

The development of a sampling strategy may start with guided samples based on a small number of households, which can be used to establish the key variables for further study. Methods used in guided sampling include structured surveys, key person interviews, group interviews, focus groups, and more creative and participatory ways of eliciting information. Once this initial information is collected, it is possible to conduct more extensive research. Selection of households for more detailed data collection may take place on either a random or a directed basis.
Various types of sampling strategies include:

- random sampling - the selection of households or individuals on a random basis;
- stratified random sampling - groups or strata of the population are separated for certain features (for instance people with land and landless people), each group/ strata is treated as a separate case, and a sample established for each;
- cluster sampling - individuals or households are chosen in groups or clusters and not on an individual basis, and within each cluster, a random sampling method is used (for example, one cluster may be those who plant in a dry area with poor growing conditions); and
- multi-stage sampling - samples are selected using simple random sampling, and from these samples, a new set of samples are drawn.

Tools for participatory research

Outlined below is a list of tools that may be used for participatory research. They are in a rough sequence of how they could be used in the field, beginning with the collection of baseline data to guide sampling, to the more extensive and in-depth studies. This should not be interpreted as a rigid sequence; many tools are useful at multiple stages of research.

Collection of available information

Collection of all existing information should be the first step in any research process because it saves time and duplication of effort, and because it prepares the researcher for interactions with the community. Previously published information, which may be useful for researching crop diversity, are those related to crop ecosystems, the communities which manage them, or to the crops themselves. Existing environmental data, ecological and geographical maps, as well as social or anthropological studies are particularly helpful.

Participant observation

Definition: Participant observation is a classical anthropological tool which has been used predominantly to study community and individual behavioural patterns. Participant observation is the process of documenting observations in a systematic and continuous way, without disrupting the processes, people, or locations being observed.

Uses: Participant observation can be used to gain baseline information about human communities, behavioural or management patterns, as well as social structures and human interactions. In addition, basic observation can be used to assess crop populations, diversity among crops, phenotypic variation, and crop ecosystems. This information can be used to develop a sampling strategy for more in-depth research, or it can be used to support other types of data.

Advantages: Basic observation is the simplest way of obtaining a general understanding of the variables which are going to be researched. When carried to a more extensive level, the observation can provide the researcher with a great deal of easily accessible and highly useful information.

Disadvantages: Participant observation is frequently not the neutral tool that it is intended to be; the mere process of observing often influences the subject that is being observed, and the results may be biased by the individual interpretations of the researcher. In addition, participant observation is not an interactive form of research, unless members of the community act as both the observers and the observed.

Participatory Rural Appraisal (PRA)

Definition: This is an intensive, iterative, and expeditious form of research, which relies on small multidisciplinary teams that employ a range of methods, tools, and techniques specifically selected to enhance understanding of rural conditions by tapping the knowledge of local inhabitants. Its most outstanding characteristics are flexibility, minimal resource requirements, and the central role given to intensive dialogue, varied types of communication, and researcher-community cooperation in order to access community knowledge. Triangulation is a common technique employed in choosing methods, sites, and participants in research, so that a minimum of three perspectives provides a range of variables to be studied.

PRA places a strong emphasis on sharing ownership with participating communities, through the incorporation of community goals and needs into the design, objectives, and uses of the research. With the new questions and insights generated by conducting basic exercises with communities, researchers can move more directly toward understanding problems and facilitating the development of appropriate solutions. Modifications of previous methods, as well as new tools for this type of research are constantly being generated, as researchers develop their own means of working interactively with communities. A partial list of commonly used tools is given below. Most of these tools are effective in eliciting the specialist knowledge related to gender or other factors when conducted with separate focus groups.

Uses: PRA, in particular, can provide useful tools for conducting various types of participatory research. PRA techniques can be used to gain both a general and a more in-depth understanding of community knowledge. A general understanding of community characteristics can help to guide the development of a sampling strategy for further research, while more extensive community knowledge can be used to supplement other types of qualitative and quantitative data.

Advantages: Most of the PRA techniques are designed to be inexpensive and easy for anyone to participate in. They generate a great deal of information in a short amount of time and provide insight into social behaviours and management practices.

Disadvantages: PRA techniques require a good and experienced facilitator. Interpreted out of context and taken on their own, the data produced from these techniques can be superficial. They should be used in conjunction with other tools as a means to generate new perspectives and research orientation.

Partial list of tools

Community mapping
Historical mapping
Transect walks
Ranking, rating, sorting exercise
Semi-structured interviews
Local knowledge forms - folk taxonomies
Seasonal calendars
Labour calendars
Logic/decision trees
Drawing - bar, venn, flow diagrams

Brief tool descriptions

Community mapping/historical mapping

Study of resource management requires knowledge of both the spatial distributions of resources and of how these resources are utilized. These exercises involve the community in mapping with the purpose of generating information about the local environment and social systems, gauging community perceptions of ownership, responsibility, physical or social boundaries, and clarifying relationships between environmental factors and agricultural activities. Using previously drawn maps, participants can identify the exact location of resources and patterns of resource usage. Participants can themselves map local infrastructure, land tenure systems, spatial distribution of crops and their relationship to natural resources. It is useful to do mapping in the field so that it can be supported by direct observation. The information generated from mapping can be used to develop a sampling strategy or to collect detailed data.

Historical mapping can be used to document the history of the community or a certain group within the community, and can be done in pictures, writing or symbols. The timetable may be focused on a specific subject such as natural or communal resource management, or the impact of village growth or economic change on the surrounding environment. This tool can give a temporal dimension to the studies of diversity.

Transect walks

The purpose of transect walks is to provide a good representation of the social or biological variation within an area being studied, as well as to document as much information as possible from direct observation of the community and the local environment. One use of a transect walk is to delimit the main agroecological zones within a community, chosen subjectively as being distinct in terms of one or more ecological, agricultural, social, or economic feature. Another use may be to illustrate the variation and spatial location of social units found within a community, in order to develop an appropriate sampling strategy.

Ranking, rating, and sorting exercises

These tools are simple and inexpensive ways to provide insight into individual or group decision-making and to identify the criteria that people use to select certain items or activities. When used with different groups and compared, they can pinpoint differences in perception, identify priorities, and monitor changes in preference. In addition, they can translate qualitative information into quantitative form. This type of information is valuable for understanding the ways in which communities value and manage crop species.

Ranking - The process of ranking a certain number of items on the basis of a certain criteria. For instance, participants might rank tree species on the basis of their general usefulness, where usefulness is defined by group criteria.

Rating - This process, which works best with literate people, involves rating certain statements or ideas on a scale which runs from complete agreement to total disagreement. For example, participants may be given a statement about a method of crop management and asked to rate how strongly they agree with the statement.

Sorting - The process of sorting a unit according to its characteristics into clearly defined categories. For instance, participants could sort households between three categories of household economics. The defining characteristics of each category can be decided by the group.

Note: Whether ranking, rating, or sorting, select a sample that will be a representative of the community or the group from whom information is required. The design of the exercise should include the input of the participants to ensure the relevancy of the questions, and of the categories that they select. Keep the choices straightforward, and summarize the results in an easily understood format.

Semi-structured interview
Semi-structured interviews are conducted with a fairly open framework which allow for a focused, conversational, two-way communication. This type of interview is useful because it allows researchers to obtain specific quantitative and qualitative information from a sample of the population, to probe for unknown information, and to get a broad range of insights.

Local knowledge - terminology
One method of assessing the diversity preserved in agroecological systems is by determining the specific values that individuals assign to crops, and the reasons these crops continue to be grown and used within the community. Determining the ways in which farmers perceive certain varieties to be distinct, can be accomplished either by questioning farmers about the distinctive uses of the crops, the variation they perceive in crop properties, or about the names they give to different varieties.

In linguistically complex regions where different languages and dialects are found, recognizing and understanding local terminology is important. Using the local terms when asking questions helps interviewers to gather accurate information. In addition, folk taxonomy can be used as a tool to understand how people classify and value resources and environments, which in turn is reflected in their different management strategies.

Seasonal calendars/labour calendars - activity sequences
Preparing seasonal calendars with communities which outline an entire agricultural season, the crop sequences grown, and associated tasks, can supply information on environmental factors, as well as management decisions, value systems, and labour responsibilities.

Labour calendars focus on the labour tasks performed throughout the agricultural season. This tool is especially useful for illustrating gender-differentiated responsibilities and crops management. If a particular farm work can be broken down into an activity sequence, it may be informative to ask questions about the individual activities. Separate activity sequences can be determined for years where environmental or community conditions may have altered in order to assess the impact of such changes.

Logic/decision trees
Decision trees can be used to identify distinctive livelihood systems, farmer strategies, and decision-making which shape the management of crop diversity. Decision trees may be constructed from the information gathered in transect walks, through direct

observation, and through interviews. The logic tree can be drawn to classify farmers by types of operation or pattern of resource usage as observed by the researcher. The diagram of the logic tree should include key determinants placed at strategic branching points. The decision tree can be drawn to illustrate the key factors or important conditions that influence the farmer in deciding on one type of cropping pattern or management.

Diagrams
Structured diagrams are a tool for illustrating farmers' knowledge in a quantified or conceptual way. Bar diagrams, flow diagrams, and venn diagrams can all be used to illustrate different conceptual properties. Bar diagrams illustrate proportional relationships, such as the proportion of different resources held by different types of farmers. Flow diagrams are designed to show the interrelationships between different variables, such as the interrelationship between production and marketing and the costs and returns at different stages. Venn diagrams would also show interrelationships, often between institutions or groups of decision-makers.

Unstructured diagrams are also a useful tool for eliciting farmer knowledge, especially in cases where the community members are oriented toward visual forms of expression, or do not share similar languages. Furthermore, while each gender knows its role within the production system, this is often in an implicit rather than an explicit manner. A diagram can help record and reflect this knowledge and provide course for further reflection.

Interviews

Group interviews

Definition: A group interview is a gathering of people with a facilitator for discussion of an issue. The meeting can involve a large number of people or a smaller number who focus on a specific problem or purpose. Semi-structured interviews are those in which there is a specific agenda to be discussed, but there remains a degree of flexibility. This ensures that the individuals discussing the issue are able to modify the direction of the interview according to the information that is revealed.

Uses: Meetings can be used to gather general and commonly shared information. For example, questions may be asked about the community structure and function, the characteristics of local ecosystems, commonly held natural and agricultural resources, the predominant crop varieties raised by the community, the types of commonly encountered pests or difficulties with certain varieties, commonly held perceptions of the uses and values of particular crops, etc.

Advantages: Meetings are useful in that they reach many people in a short time, they elicit commonly shared information and encourage a flow of ideas between group members, and they help to establish a rapport between researchers and community members.

Disadvantages: One disadvantage of meetings is that while they allow for the sharing of common information, the views and specialized knowledge of certain individuals or marginalized groups are commonly not heard.

Focus group interviews

Definition: Focus group meetings are made up of people with similar concerns, who can speak comfortably together, and who share a common problem and purpose. Focus group meetings can be used as a tool to elicit knowledge shared by a certain group which is not expressed in the context of a larger gathering. This information can be compared to that generated by the larger group.

Uses: Focus groups can be used to generate information that is shared among a smaller group of people. Usually all the questions that are raised with larger groups can be raised in the context of focus groups interviews in order to obtain the specific views and specialized knowledge of the group being addressed. For example, focus groups can be asked questions about what are the major uses for a particular species *by a particular group*, how is the species managed, who is it managed by, and why the species is perceived as useful. Comparing responses made by smaller and larger groups generate insights about the individual groups represented, as well as the interaction between different factions of the community.

Advantages: Views and specialized knowledge which are not expressed within larger groups can be elicited.

Disadvantages: No matter how small the group, there is still a tendency for some individuals to dominate the discussion. To obtain the knowledge of all group members, it may be necessary to conduct personal interviews, or to use questionnaires.

Individual interviews

Definition: These are interviews conducted with one informant in order to elicit the specific knowledge of the individual. Key informant interviews are interviews with individuals who are particularly knowledgeable about a particular issue, who are accessible, and are willing to talk.

Uses: Individual interviews may generate any of the types of information described above, and are particularly useful for eliciting quite specific, individually held information. They also can be used to ascertain unique views, not presented elsewhere.

Advantages: These interviews are least influenced by the physical presence of other members of the community. They are the most direct way of understanding individual knowledge and management patterns.

Disadvantages: In order to be of use when studying a community or a crop population, many individual interviews must be conducted in order to elicit the knowledge and information of a group. Individual interviews are costly in terms of time and other resources.

Guidelines for group, focus group, and individual interviews: adapted from FAO, The Community's Toolbox, 1990.

- Have a clear purpose for the meeting and develop an agenda which includes researcher and community goals.
- Obtain the approval and involvement of local leaders. Be aware of local customs and protocol.
- Arrange a convenient time and place for the meeting, considering both the size and composition of the group.
- Select a practiced facilitator, and plan a strategy to encourage discussions and two-way communication.
- Hold separate focus group meetings for factions of the community who are unable or unwilling to speak up in larger gatherings.

Questionnaires

Definition: Questionnaires are lists of questions designed to elicit specific information from individuals or from the primary research samples being studied within a community, e.g. households, groups working on the same agricultural plot, etc. They are usually used with selected samples that have been chosen out of the entire population by means of a rough characterization tool, such as focus groups. Questionnaires gather both quantitative and/or qualitative information. While they may be in the form of a survey which the participant fills out, they are usually a series of questions delivered orally by a researcher who then records the individual responses. Data from questionnaires is pooled and may be analyzed in order to obtain information and statistics related to specific issues.

Uses: Questionnaires may be used to gather specific data from a research sample which can be used to support hypothesis, or to explore relationships between variables. This data can be about individuals, households, parcel/plots, communities or ecosystems. Quantitative questions directed to households include questions such as what is the household composition, gender composition, ethnicity living standard, tenure, educational status, etc. Questions about parcel/plots may include the land quality, purchased inputs, labour responsibilities, use of crops, seed source, perceived genetic diversity, etc. Qualitative questions on questionnaires may take the form of a ranking exercise such as the ranking of the values perceived in a crop. This type of information *should not replace* other types of qualitative information, but should be used in conjunction with other tools, in order to obtain a more holistic picture of the issue being researched.

Advantages: Questionnaires allow the translation of individual quantitative and qualitative knowledge into a numerical form. This numerical form is of value because it can be used to measure certain characteristics, to explore the relationship between variables, to gain a statistical understanding of a community or crop population, and to argue for or against hypotheses about communities' maintenance and use of diversity.

Disadvantages: The most useful questionnaires are precise and well-honed tools. To work efficiently, they must be used with a well-defined sample to explore a well-defined issue. They are often quite long and complex, because of the amount and detail of the information being sought. It is essential to keep questionnaires both relevant and concise so that they do not become a burden to the participant or to the researcher. In addition, questionnaires are the least interactive form of information retrieval; they do not typically allow for any reciprocal exchange of knowledge or input from participants in the research process. One solution to this problem is to solicit the help of the community in designing and facilitating the questionnaire.

Tools for the elicitation of farmer knowledge[4]

Interview Techniques: semi-structured surveys, key informant interviews, the use of focus groups, individual interviews
(e.g. Beebe 1985, Byerlee and Collinson 1980)

Assessment of Local Knowledge Systems: Folk taxonomies, farmer classification of land types, traditional systems of organization, oral histories, status distinctions, decision point analysis
(e.g. Warren and Cashman 1988)

[4] Adapted from *Larry Harrington*, New Frontiers in Participatory Research and Gender Analysis.

Community Exploration Techniques: Community appraisals, group treks, participatory workshops, rapid site description, transects, biophysical assessments, indigenous indicators
(e.g. Chambers and Ghildyal 1985, Conway *et al.* 1987)

Diagramming Techniques: resource flow diagrams, seasonal diagrams, decision trees, problem-cause diagrams
(e.g. Lightfoot *et al.* 1989)

Mapping Techniques: sketches, historical patterns, agroecosystem zoning
(e.g. Chambers 1990)

Time Flow Analysis: seasonal calendars, time lines, time allocation studies
(e.g. Maxwell 1984)

Farmer Experimentation: farmer's adaptations, farmer-managed experiments, farmer selection from among multiple alternatives
(e.g. Ashby 1987, Quiros at al. 1991)

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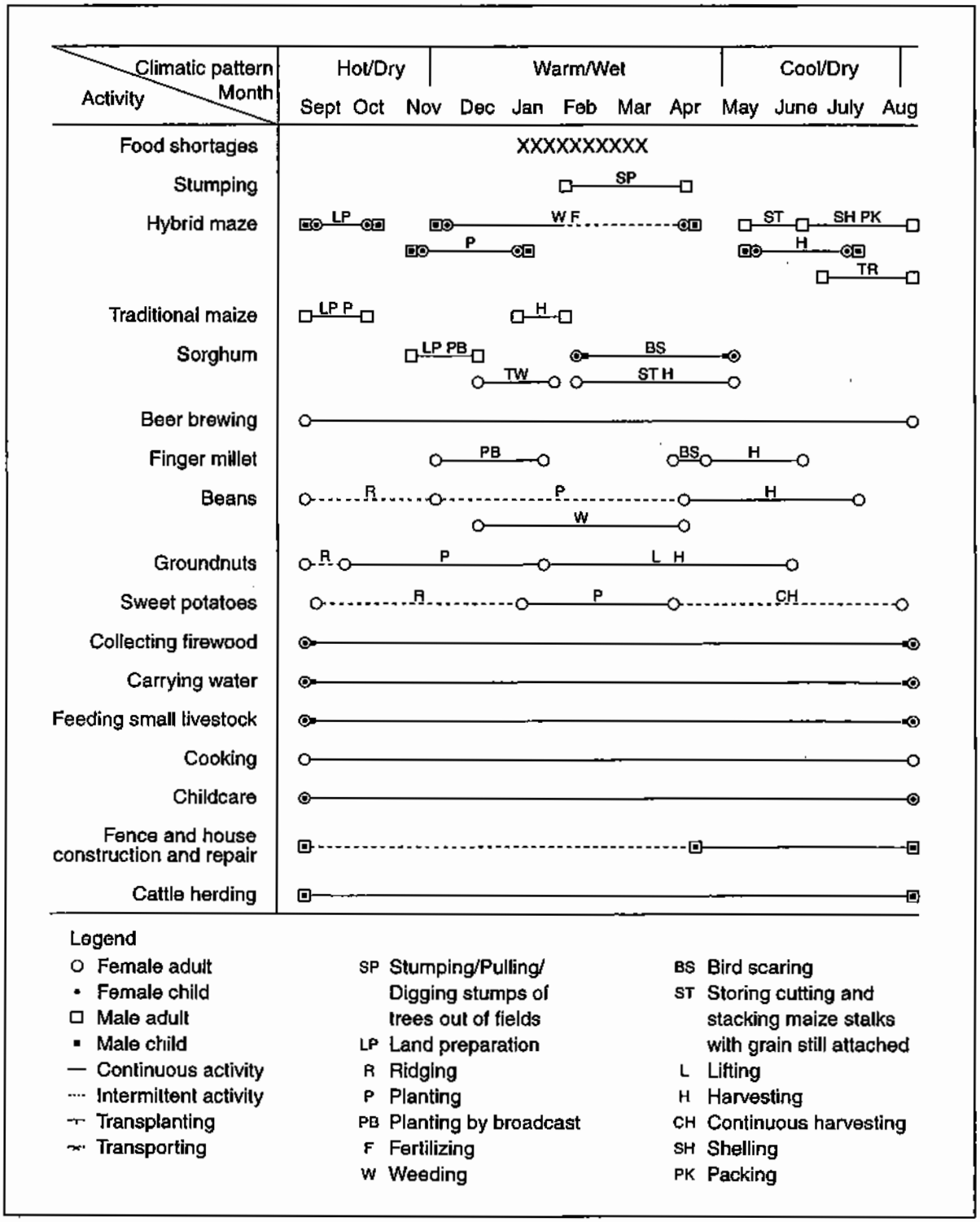
Fig. 1. Gender Disaggregated Activity Calendar



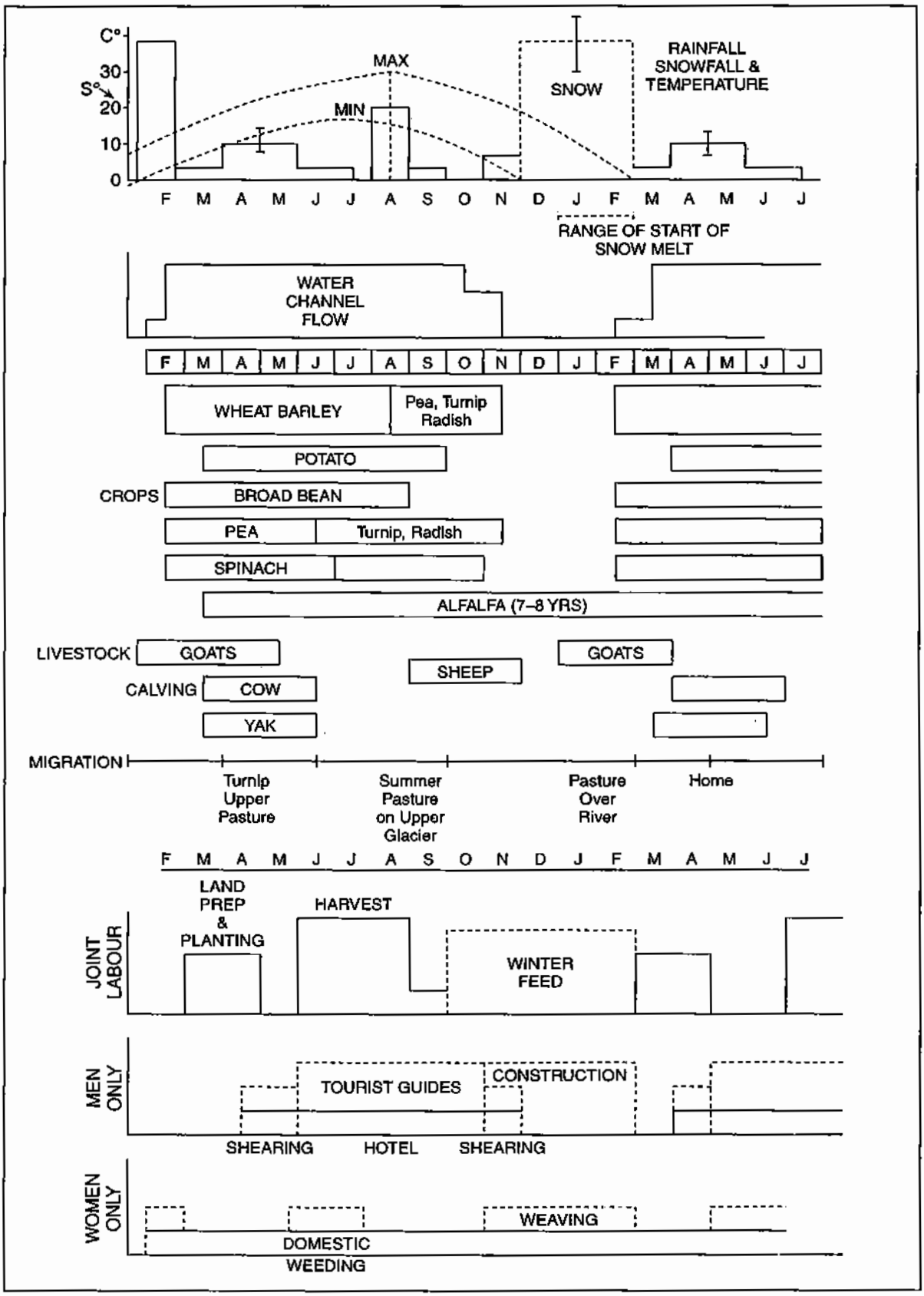
Gender-disaggregated activity calendar for Mkushi District
Source: Hilary Sims Feidstein and Susan V. Poats, eds. 1989. *Working Together Gender Analysis iin Agriculture*, vol. 2 (West Hartford, Conn,: Kumarian Press).

Table 1. Tracing Pathways in Using Gender Analysis & PRA

Research context & objectives	Methods used for stakeholder identification	Inclusion: Participatory method	Inclusion: refinements for including different users	Contributions: participatory method	Contributions: user refinements	Results for technology design	Project impacts
	• Key informant interviews • Community enterprise analysis	• Maps	Separate men and women	• Natural resources, enterprise, locations, different neighbourhoods	Men's and women's different knowledge and priorities		1. Acceptability by farmers; adoption 2. Greater cost effectiveness of research
	• Transcept • Wealth ranking	• Transepts	Joint	• Natural resources, enterprise management, landscape history	?		3. Contributions of the technology to sustainability, measuring both
				• Important stakeholders, potential alliances	Differences in perceptions of who are stakeholders; additional stakeholders identified?		4. Impact on family welfare as measured within the household
		• Venn diagram	Separate men and women, owners and hired labor	Importance of weeding to crop production, insect identification, constraints to weeding			5. Impact on or relevance to specifically, poor rural women and other marginalized groups
		• Participant observation	Female researcher with women during commercial weeding		Same		6. Impact on the position of poor rural women (empower) 7. The efficacy of various use: differentiates participatory methods

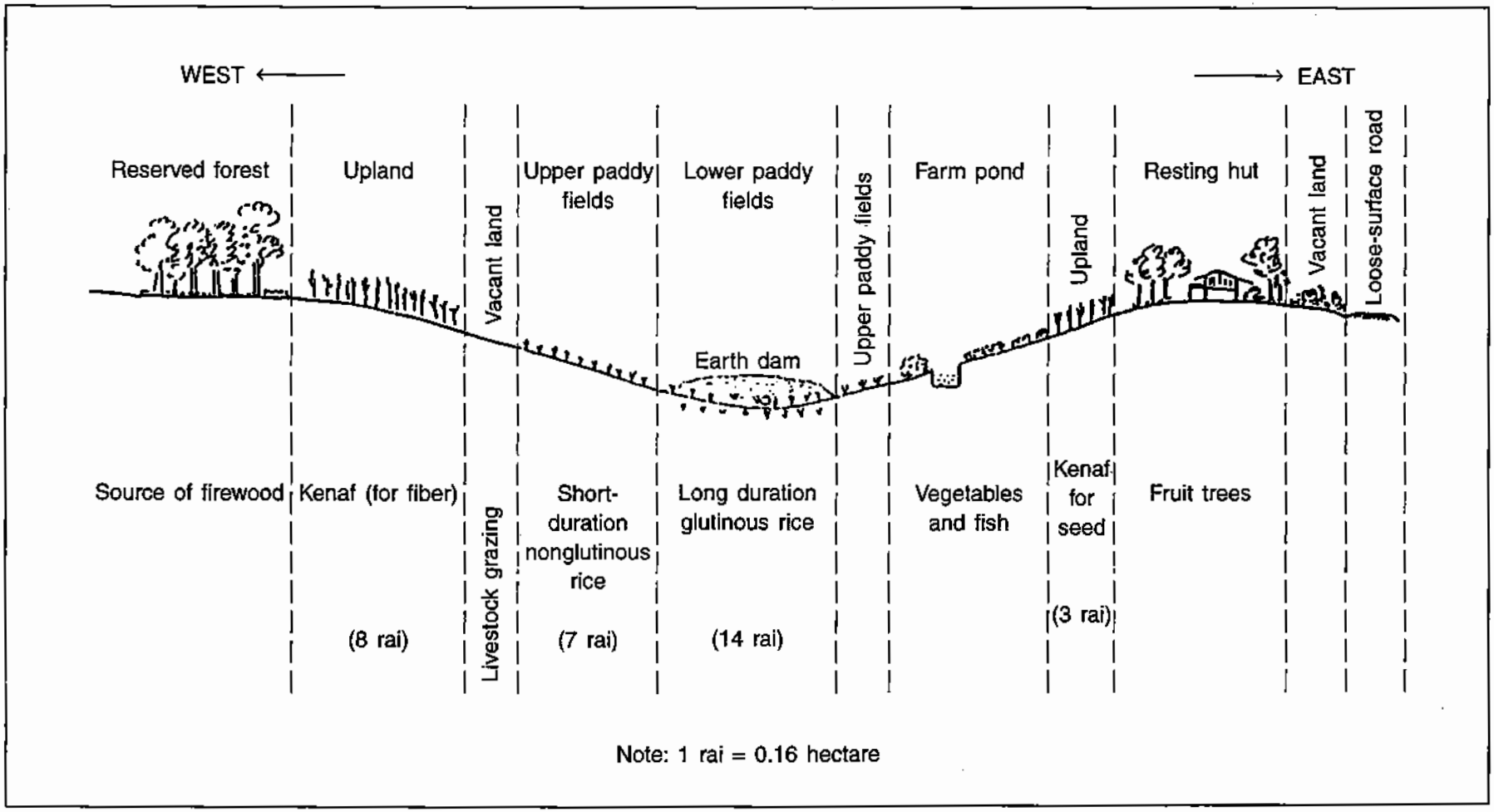
Tracing pathways on the use of gender analysis and other methodologies for the identification and inclusion of differentiated stakeholders and their contributions to technology design and project impact

Fig. 2. Seasonal Calendars



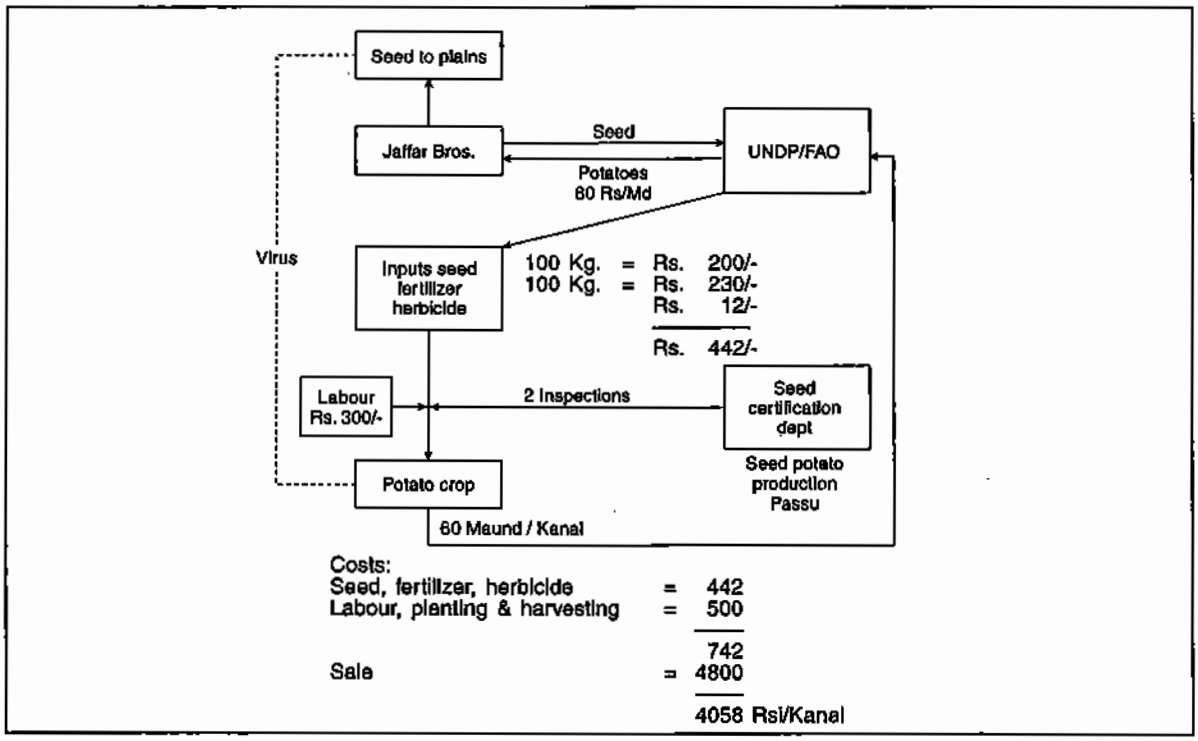
Seasonal calendar for Passu
Source: Conway *et al.* 1985

Fig. 3. Transect Map



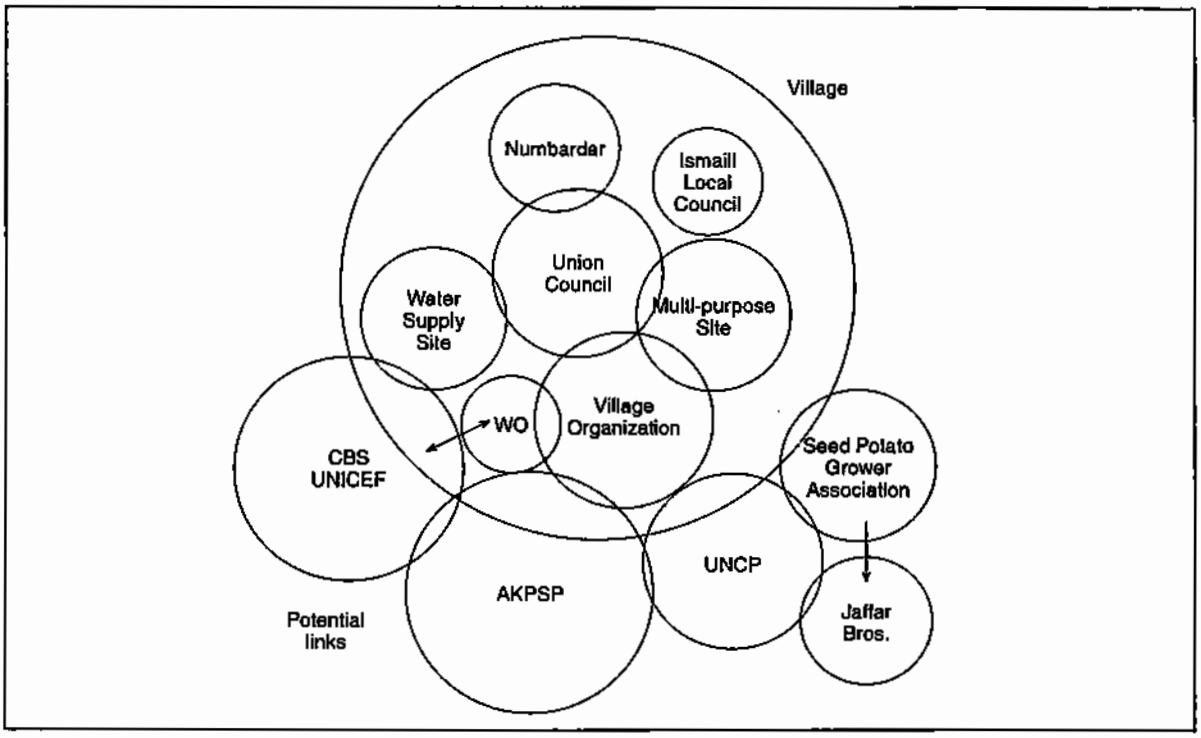
Transect map of the undulating farm land of a Khon Kaen Farm Household
Source: KKU-USAID Farming Systems Research project, unpublished.

Fig. 4. Flow Diagram – Germplasm Production and Marketing



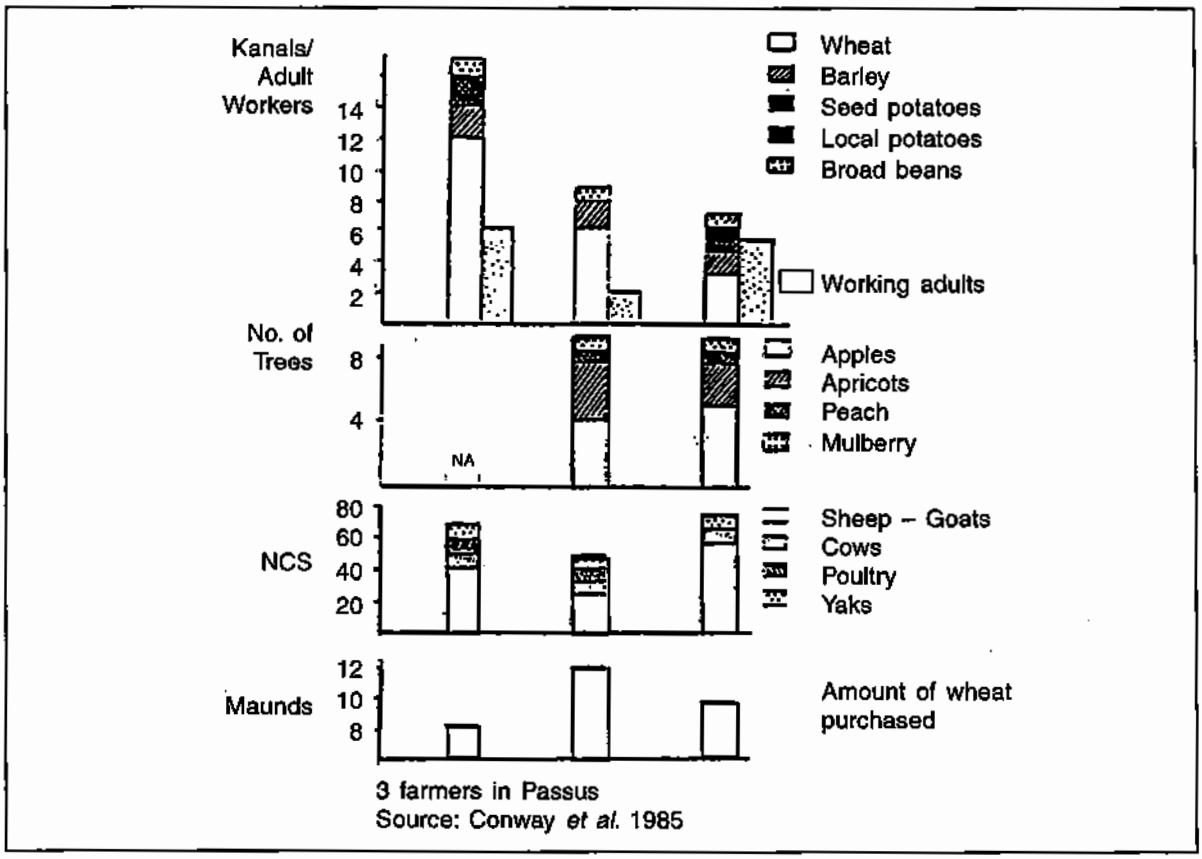
Flow diagram of seed potato production and marketing in Passu
Source: Conway *et al.* 1985.

Fig. 5. Venn Diagram



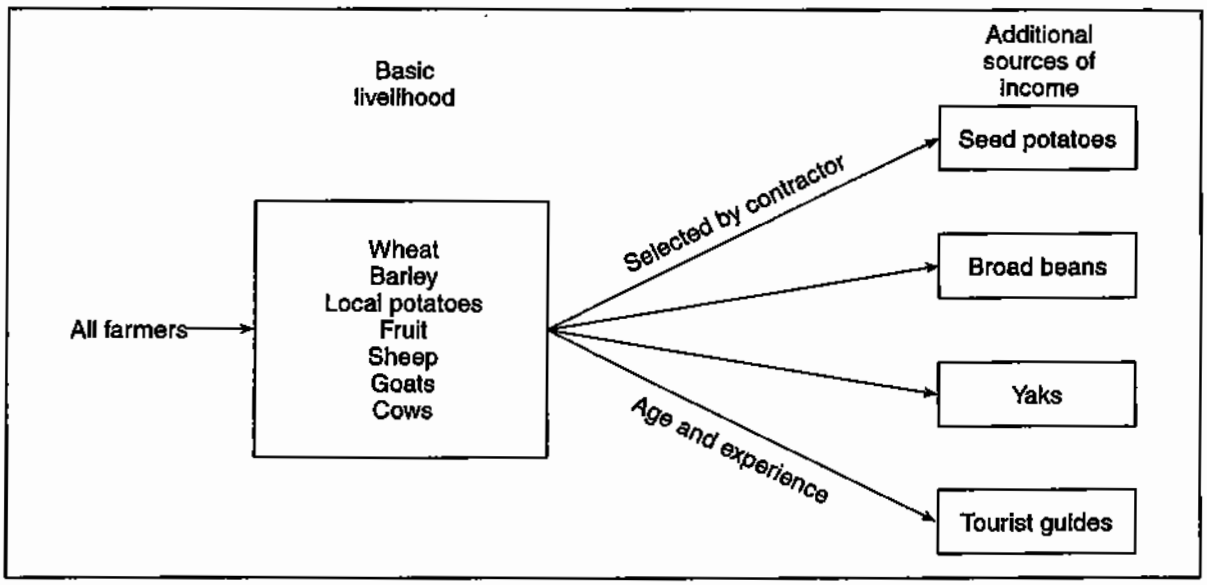
Venn digram of institutional overlap in Passu (WO = Women's organization)
Source: Conway *et al.* 1985.

Fig. 6. Bar Diagram – Income and Resources



Bar diagram showing sources of income, amounts of wheat purchased and size of working population for three farmers in Passu.
Source: Conway *et al.* 1985.

Fig. 7. Decision Tree



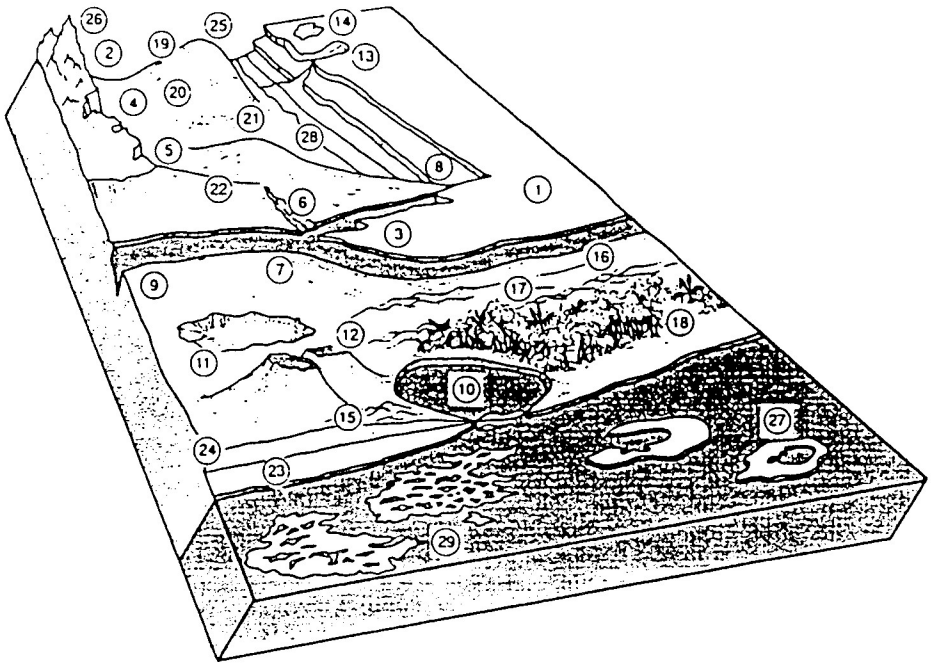
Decision Tree for Livelihood Systems in Passu
Source: Conway *et al.* 1985.

Table 2. Operational Scope of PRA Methods

	Major method: Semi-structured interviewing (of household members and key informants)			Methods to combine with semi-substructured interviewing:				
Methods for organization/ operation	**Interview team techniques**	**Individual/ general tools techniques**	**Time/space and schematics**	**For verbal information**	**Pre-existing information**	**On-site observation**	**Indicators**	**Physical measurements**
– RRA literature and training – Interview guides (sub-topics) – Site selection (triangulation) – Use of available information and key informants – Techniques for team information and decision sharing – Etc. RECORDING: – "Gradeschool" notebook – Cameras – Videocameras – Tape recorders – Sketches/ Diagrams/ Graphs – Bringing back actual items/ samples – Etc.	– Fixed team vs. Rotate ("Sondeo") – Guidelines for protocols – Specific protocols – Etc.	– Non-leading questions – Six helpers" – Probing – Local names – Folk taxonomy – Oral history – Etc.	– Crop Calendar – Specific types of crop calendar – Time line – Cross section – Transect – Historical transect – Village map – Field map – Logic/decision trees – Labor calendar – Activity sequence – Etc.	– "Focus group" – Open discussion – "Compact questionnaire	– Studies/ reports – Site data – Statistics – Maps – Aerial photos – Expert opinion	– Roads/trails – Transects – Village walks – Field visits – High place with view – Houses/ compounds – Shops/ meeting places – Etc	– General – Specific COUNTS – Houses – Fields – Vehicles – Etc.	– Tape measure – Scales – Volume measurement (E.g. immersion gauge) – "Bicycle wheel" odometer – Pedometer – Transits – Levels – Rangefinders – Altimeters – Etc.

Examples of potential breadth and depth of PRA methodology
Source: Adapted from Khan Karn, 1985.

Fig. 8 Examples of Geomorphological Descriptors



Land element and position

Description of the geomorphology of the immediate surroundings of the collection site (Adapted from FAO 1990).

1. Plain level
2. Escarpment
3. Interfluve
4. Valley
5. Valley floor
6. Channel
7. Levee
8. Terrace
9. Floodplain
10. Lagoon
11. Pan
12. Caldera
13. Open depression
14. Closed depression
15. Dune
16. Longitudinal dune
17. Interdunal depression
18. Mangrove
19. Upper slope
20. Mid slope
21. Lower slope
22. Ridge
23. Beach
24. Beachridge
25. Rounded summit
26. Summit
27. Coral stoll
28. Drainage line (bottom. Position in flat or almost flat Terrain).
29. Coral reef

Use of participatory approaches to agricultural research and development: the CIP-UPWARD experience

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Need and importance of farmer participation in agricultural R&D

Agricultural R&D have been almost exclusively associated with formal institutions and professionals. Institutions and professionals are the ones who usually conduct merited researches. It is only in recent years that we recognized that R&D activities are integral elements of the local knowledge system.

Formal R&D institutions and professionals used to assume entirely the task of offering technological products to users. Now we are beginning to ask, how can we facilitate users' own R&D activities? How can the formal R&D sector build a partnership with the local knowledge system in working towards shared goals? How can agricultural R&D be made as a joint process of learning and innovation with both the formal and informal systems making their complementary contributions?

Long-term, sustainable development depends on mobilizing people. At the lowest level, however, participation is merely the presence of token representatives of the people at events where decisions are made. Most would agree this does not constitute real participation.

At a more dynamic level, which is meaningful in terms of mobilizing people towards development goals, participation involves an active partnership between policymakers, planners, development workers, officials and the target beneficiaries of a programme. This usually requires some organization of people into groups which become action-oriented and eventually take responsibility for their own development. In the fullest sense, participation is the empowering mechanism which increases the capacity of people to act in their behalf (Stephens 1990).

The UPWARD approach

Recognizing the dilemma of the conventional paradigm, UPWARD pioneers look for alternative approaches to address the seemingly lack of user participation in agricultural R&D. UPWARD is a network of scientist and development specialist seeking to support the participation of technology users in research and development, and with the ultimate goal of contributing to increased sustainability of rootcrop agriculture and food system in Asia.

Launched in 1989 under the sponsorship of the International Potato Center (CIP), UPWARD has engaged in field R&D projects which involve users both as participants in and beneficiaries of the R&D process. These projects, located in various parts of Asia, cover three thematic areas in rootcrop R&D - production systems, genetic resources, and processing-marketing-consumption. In addition to generating relevant knowledge about rootcrops, UPWARD projects serve as a vehicle for testing and promoting user-sensitive participatory approaches (Box 1). Most importantly, these projects have been instrumental in pushing for an R&D paradigm shift in the institutions where project researchers are affiliated.

Box 1. Key elements of the user participatory approach

- *Sensitivity to users' perspectives*, those from different types and catefories of users including, not only farmers, but also processors, traders, consumers and other relevant actors;
- *Focus on households*, taking the household as the basic unit for decision-making and action, including the dynamics of its members and of supra-households;
- *Food systems framework*, locating technological change within the broader system of food production, processing, marketing and consumption;
- *Integration of scientific and local knowledge*, drawing on both science-based and local knowledge as complementary resources to support innovation;
- *Interdisciplinary mode*, bringing together various biophysical and social disciplines whose collective inputs are critical for a successful R&D;
- *Multi-agency teamwork*, facilitating relevant agencies and other entities representing various sectors and interests to form working partnerships supportive of the R&D process;
- *Problem-based agenda*, orienting R&D to address locally perceived constraints and opportunities in agriculture and food systems; and
- *Secondary crop orientations*, recognizing the functions of rootcrops and other secondary crops in order to better harness their agroecological and socioeconomic contributions.

UPWARD views agricultural R&D as a process involving three main interlocking phases, namely:

- *Diagnostic phase*, which covers the early stages of documentation, situation analysis, needs assessment, problem identification and resource inventory. The outcomes provide the basis for determining the need for and focus of the action research phase.
- *Action research phase*, which covers the stages of planning, development and testing of feasible options in addressing identified problems and opportunities.
- *Local R&D management phase*, which covers the stages of scaling up, local-level long-term planning, sustained action, institutionalization, policy formulation and capacity building.

A major interest of UPWARD is in exploring how the formal R&D sector can work in partnership with users by strengthening their inherent capacity to devise solutions to perceived problems. Its field projects seek to demonstrate how users can become actively involved at different phases of agricultural R&D, such as through the following roles:

- *Users as consultants*, whereby interdisciplinary teams consult with users on perceptions of local systems and needs. Gaining users' perspectives is particularly important in diagnostic, descriptive and assessment activities.
- *Users as research partners*, whereby R&D professionals and users jointly generate and validate knowledge to address specific gaps, identify and evaluate options for dealing with problems and constraints, and decide on feasible solutions for improving a problem situation.
- *Users as R&D managers*, whereby users assume leadership and take management responsibility for R&D activities. R&D professionals, meanwhile, support and facilitate local initiatives while continuing to offer options for consideration by users.

Using the above framework, UPWARD researchers have engaged in field projects with users to support local knowledge systems for innovation in rootcrop agriculture. These experiences, from appraisal and documentation to action research and local R&D management, are illustrated through case projects presented in the next section.

Case projects

Case 1: Documenting local knowledge on sweet potato genetic resources

The worldwide effort to collect, conserve and evaluate plant species/varieties has historically been pursued, albeit independently, by the formal and informal R&D sectors. More popularly known are the exploratory missions of the scientific community to collect, characterize and preserve exotic species and those threatened by extinction. Less acknowledged, on the other hand, is the parallel effort of local cultivators themselves, who in seeking to secure means of livelihood, become engaged in a dynamic process of crop/species diversification, multiplication and elimination (Prain 1995). This uneven attention, in favor of the contribution of the formal R&D sector, has led to the marginalization and erosion of local knowledge that would have otherwise complemented efforts of global science towards genetic resource conservation.

While germplasm collection trips are a common practice, the collection of local knowledge associated with these genetic materials seems to be still in its infancy. Germplasm collections come with conventional passport data (e.g. varietal name, location and date) but usually excludes a documentation of the relevant knowledge that farmers have about the genetic materials (e.g. local taxonomies, evaluation criteria, adaptations, practices and other technologies). In the case of sweetpotato, UPWARD has sought to fill in this gap by documenting both the genetic and cultural knowledge linked to the crop's genetic diversity.

One such effort is a comprehensive documentation approach, through memory banking, in a project in southern Philippines (Sandoval 1994b). Memory banking attempts to systematize the collection, storage and retrieval of information on cultural practices associated with traditional crop varieties. Tapping and storing of users' knowledge, beliefs and practices were done through a mix of formal and informal methods (Box 2) for the collection and preservation of herbarium specimens of local varieties, simultaneous with the documentation of farmers' characterization and evaluation of each material collected.

The study found, among others, that users distinguish varieties on the basis of local criteria such as morphological characters, gastronomic quality, life habit, familiarity and functionality. One of the project's concrete outputs is a memory bank containing the herbarium specimens for each variety together with technical characterization, scientific illustrations, and users' own characterization and evaluation. A memory bank complements germplasm collections and offers supplementary cultural information often lacking in standard technical documentation. The logical next step to this approach, which is now on-going (Prain and Piniero 1994), is the preservation of a small patch of land in each region where the local crop varieties can be maintained *in situ* for purposes of retaining genetic diversity, verifying local names and refreshing farmers' memories (Sandoval 1994b).

Box 2. Methods and outputs of memory banking (adapted from Sandoval 1995a)

Specific methods	Domains investigated
Collection/preservation	Local genetic resources; distribution and diversity
Rapid appraisal/participant observation	Local patterns of production exchange and consumption
Benchmark socioeconomic survey	Patterns of variation within and between farming communities
Interview with gatekeepers	History from above
Life history elicitation	History from below
Diagramming by key informants	Relative salience of different features
Triads test	Indigenous evaluation criteria
Sorting/ranking	Local classification preferences
Verification studies/field and sources market survey	Distribution of local knowledge; degree of consensus, disagreement

Case 2: Facilitating farmer research on integrated crop management

Earlier experiences in developing countries have shown that a single technology fix cannot be expected to work successfully under the diverse conditions where farmers operate. On the other hand, given their close familiarity with the local situation, farmers are most knowledgeable in devising a mix of technology options best suited to their own needs and circumstances.

A participatory group learning approach has been tested in southern Luzon, Philippines, through a project focusing on soil fertility management for sweetpotato production in the uplands. In an earlier diagnostic study (Bagalanon 1991), farmers identified the problem of accelerated soil fertility decline and the corresponding need for cost-effective fertility management measures. Later, through a series of community dialogues, joined by various agencies operating in the area, the farmers identified a set of potential technology options which they decided to evaluate via on-farm trials (Bagalanon and Santos 1996). See Box 3. The treatments selected by farmers included:

- Use of complete fertilizer (30-30-30) as recommended by the Department of Agriculture.
- Current farmer practice using inorganic commercial fertilizer, ammonium sulfate (21-0-0).
- Use of bio-organic fertilizer as promoted by a nearby agricultural research center.
- Combination of farmer practice and bio-organic fertilizer use.
- No fertilizer application.

Box 3. Methods and outputs of soil fertility management (adapted from Bagalanon 1991)

Specific methods	Domains investigated
Community dialogue and planning	Elicitation of farmers problems and concerns. Identification of problem solutions for possible adaptation.
Participatory on-farm evaluation trials	Participatory evaluation of identified potential technology option. Capacity building on field monitoring and evaluation among user partners.
Cross-visits and field tours	Patterns of variations with and between farming. Indigenous evaluation criteria. Local classification and preferences.
Community validation	Trial results are presented and reactions from community members are encouraged.
Community /group action planning	Identify possible action points based on project results

Researchers assisted farmers in field monitoring and evaluation through regular farm observation and discussion. Results of the on-farm trials were subsequently shared and validated in group meetings involving other farmers in the community. Based on data from eight cropping seasons, farmers concluded that the most cost-effective measure was the treatment combining farmer practice and use of bio-organic fertilizer. This conclusion was based on farmers' evaluation using their own criteria (i.e. yield, marketability, uniformity of tuber size, flesh colour and condition) together with a simple cost-benefit analysis shared with them by researchers (Bagalanon and Jabonete 1996).

During workshops, farmers pointed out that to be able to actually put to use what they learned from the trials, they needed access to the bio-organic fertilizer which was one component of the selected soil fertility management option. Taking it as an opportunity for additional income while providing the necessary input service to farmers, a local women's cooperative decided to put up a store to sell the fertilizer. Results of the farmers' fertilizer experiment have also influenced the Department of Agriculture which decided to integrate the trial results into the agency's technology recommendation. Wider diffusion of the innovation has also been made possible by setting similar farmer trials in nearby communities and the piloting of community media channels such as through print and broadcast. These simple farmer trials have created a broader institutional impact in terms of sensitizing government and private groups to work together in addressing constraints faced by upland farmers in the area. A local task force made up of farmer and community groups and concerned agencies agreed to develop a broad soil management strategy involving other technologies and actions.

Case 3: Institutionalizing local R&D management for potato production

A crucial issue often faced by R&D projects is how to sustain the innovation beyond the project life. In order to help local knowledge systems continue the research momentum initiated by field projects, it becomes necessary to institutionalize R&D management at the level of user communities. This is particularly essential for certain forms of agricultural innovation whose impact is contingent upon long-term action and community mobilization. Over the years, UPWARD has explored various ways in which the formal R&D sector can effectively support users in strengthening their capacity to manage local R&D processes.

One example is in integrated management of potato diseases. Bacterial wilt in the high hills of Nepal has lowered potato production and limited the availability of seeds for sale to growers in lower altitude, thus reducing earnings of farmers. The pathogen, *Pseudomonas solanacearum*, is soil- and seed-borne and as such is easily spread through mechanical means across farms over wide areas. The key disease management strategy is to quarantine a particular farming area and for the affected farmers to collectively apply integrated measures, i.e. elimination of infected plants, prohibiting the growing of host plants, adequate crop rotation period, rouging of volunteer potatoes and ensuring a regular supply of clean healthy seeds (Pradhanang et al 1995).

The nature of the disease and its management requires full community participation, as well as the strengthening and empowerment of local institutions, in order for the innovation to be successful (Figure 1). Given its traditionally cohesive socio-cultural system, Nepal offers a potentially suitable context for field-testing approaches in community management of agricultural R&D.

Bacterial wilt management hinges, among others, on the effective functioning of a village committee to oversee implementation of the various control measures, ensure cooperation by the entire community and enforce sanctions for non-compliance. There were contrasting degrees of success between project villages in the functioning of the village committee, owing to the community members' varying perception on the body's legal identity, police powers and political will. While village institutions were not new in the Nepali culture, given its traditional community spirit and respect for community authority, the informal character of the village committee ran against pressures for food security and income among individual households.

The experience also showed that efforts to institutionalize local R&D among user communities demand support from the wider R&D environment in terms of policies, services and infrastructures. In the case of bacterial wilt management in Nepal, the country's lack of an effectively functioning potato seed supply and certification system have turned out to be the major obstacle towards successfully overcoming the disease problem (Ghimere et al 1996).

On the whole, the community participatory approach seemed to be the only feasible option as yet for managing bacterial wilt, until such time that the formal R&D sector makes available other technology options for dealing with the particular characteristic of the disease. The approach appears to have greater promise in instances where positive ethnic and political relations exist within a community; all community members are committed to achieve the innovation and willing to face certain trade-off; the village committee achieves legitimization and popular support; alternative sources of food and income exist during the period when potato growing is restricted; and where the significance of inter-community collaboration is recognized (Gurung et al 1996).

Following the advances made with the application of the approach in western Nepal, the approach was tested in Bukidnon, central Philippines. The initial experience quickly revealed several problems with the approach which were not present in the Nepal case:

- Villages are not relatively discrete units as in Nepal, but flow one into the other with no clear boundaries between their lands.
- Land ownership is equally fluid, with cross-village land ownership/use quite common.
- Geographically demarcated areas within villages were not easy to identify.
- Ethnic divisions and a quite strong *individualistic* culture within villages made communal agreement difficult to achieve - the more communal-minded would agree to become involved, but some farmers would always resist involvement.

As a result of these difficulties, only one out of four targeted villages reached the stage of implementation of the pilot integrated pest management (IPM) site. In another village, a different strategy was attempted, which involved working with a few interested individuals. Implementation procedures for the IPM pilot site involved the formation of a village IPM committee, preparation of cropping plans for the non-solanaceous rotations, supply of seed for the rotations by the research team, agreement on IPM components, soil sampling, assay of races/biovars, monitoring in the field, group evaluations and planning meetings.

In reviewing the lessons of this approach in the Philippines as well as in Nepal, both positive and negative elements have been identified (Campilan and Prain 1996):

- There is a definite fit between the communal approach and the symptomatology of *P. solanacearum.*
- The approach utilizes indigenous *institutional* skills: the use of symbolism, ritual and the exercise of persuasion and authority within a small community.
- The approach has the potential to strengthen communal values and to underline the long-term nature of agriculture.
- The approach is highly dependent on certain types of settlement patterns and the continued exercise of authority by respected elders.
- It benefits from closely shared values and ethnic background.
- It is very vulnerable to change in value systems, authority structures or commercial opportunities.

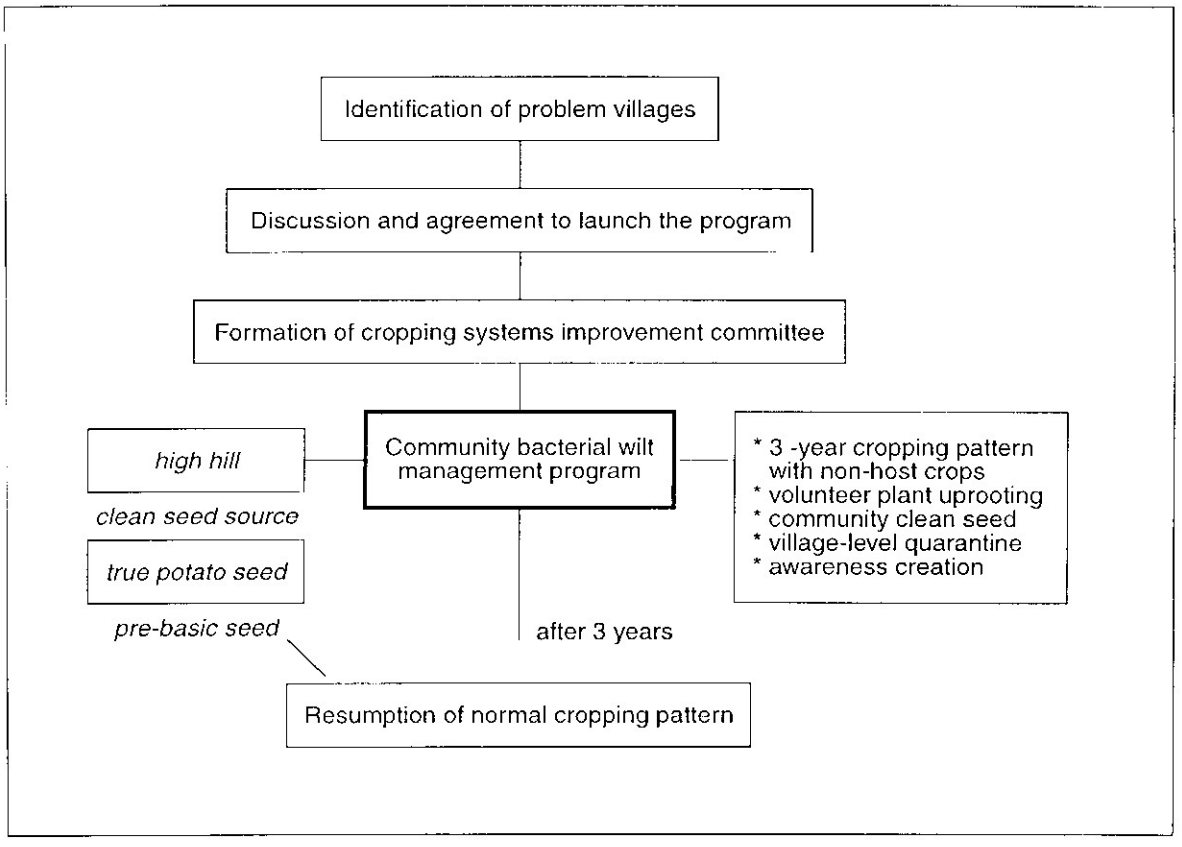
Issues and challenges in the use of participatory approaches

UPWARD's experience in working with local knowledge systems in the context of rootcrop agriculture can be summarized in terms of the following issues:

- Participatory methods are always informal, creative, flexible and interactive. They are to be modified and reconstructed as the researcher and research see fit. There is no step by step guideline on how to do it. Use of concept guides and example are urgently needed.
- There is no better training than experience. Hands-on training and experiences are needed. The only way to learn the method is to use it.
- Participatory approach may not always be quick and cheap. Some of these procedures take time.
- Innovation processes take place at the local community level, irrespective of external intervention, with users making creative use of three basic R&D tools - their local knowledge, inherent capacity for learning and experimentation, and the material resources which are locally available and/or to which users have access.
- Documentation of local knowledge needs to be seen not as an end in itself, but as a means to a higher-order goal, i.e. as input in participatory technology development. It should be viewed as the necessary first step leading to more action-oriented and capacity-building R&D activities.
- The growing emphasis on local knowledge is a welcome development in agricultural R&D. However, this need not be done in opposition to global science. We need to avoid the tendency of romanticizing local knowledge and instead, realize that in addition to its strengths, it has its share of gaps and limitations, in which the formal R&D sector can help overcome.
- Local knowledge processes do not occur in a vacuum and are in fact closely interwoven with ongoing broader social processes in the community. One of the important tasks of an effectively functioning local knowledge system is to overcome social, political and interpersonal conflicts among its various actors.

- In spite of the rhetoric on tapping local knowledge for agricultural R&D, the existing institutional set-ups, staff incentives, management priorities, training design and general policy guidelines have not been responsive to change. Without institutional and policy innovations, local knowledge will remain outside the mainstream of agricultural R&D.
- It is admittedly difficult to change the dominant R&D paradigms which have for so long guided institutions and professionals. As such, one key challenge is for us to demonstrate to them that local knowledge does make a significant positive contribution to the process and impact of agricultural R&D. More importantly, there is still a lot of work for us to do in the search for methods, tools and indicators to help users systematically assess local knowledge and provide empirical evidence on the difference that user-sensitive R&D can make for improving agriculture.

Figure 1. Schematic diagram of community approach to bacterial wilt management



Source: (Dhital et al 1996)

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The loss of locally adapted tall coconut varieties in the Philippines

Edwin Balbarino
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Introduction

Filipinos called coconut the 'tree of life'. This is because all parts of the tree, from roots to the leaves have potential uses for the household and industry. Coconut has been considered a reliable source of income for most Filipino farmers. While copra is the most important product derived from coconut, a great variety of products could also be produced from the crop. In this era of international trade competition, it is but imperative to search and develop other products from coconut that are acceptable in the world market. Hence, there is a need to assess and conserve the native and adapted tall varieties that offer diverse coconut genetic resources for future breeding and development programme for a particular economic purpose.

The local tall coconuts are in a bad state. In the Philippines, thousands of coconut trees are cut and harvested each year, both from big and small farms. In an informal study conducted, it was discovered that the loss of tall coconut genetic resources in the Philippines is caused by four major factors, namely:

- replacement of traditional varieties with hybrids;
- conversion of coconut areas to other landuse (crop production systems);
- massive cutting of coconut trees for lumber; and
- loss of coconut due to pests, diseases, fire, typhoon and adverse climatic conditions.

The conceptual representation of the factors causing genetic erosion in coconut is illustrated in Figure 1.

Replacement of traditional varieties with hybrids

In the late 1970s the Philippines embarked on a big programme of planting coconut hybrids throughout he country. The initial impressive performance of the hybrid coconut in the demonstration and pilot farms has convinced coconut farmers to plant the new varieties. In some areas old and less productive coconut trees were cut down to give way to the planting of new varieties which farmers called "hybrid" or "dwarf".

Conversion of coconut areas to other landuse systems

There was a time when the price of copra was too low causing many farmers to shift from coconut farming to other cropping systems. The establishment of irrigation systems in the country prompted many farmers to convert their coconut farms in flat lands to rice farms. In some areas, coconut farms near the population centres were cleared to give way to housing projects and other land uses.

Massive cutting of coconut trees

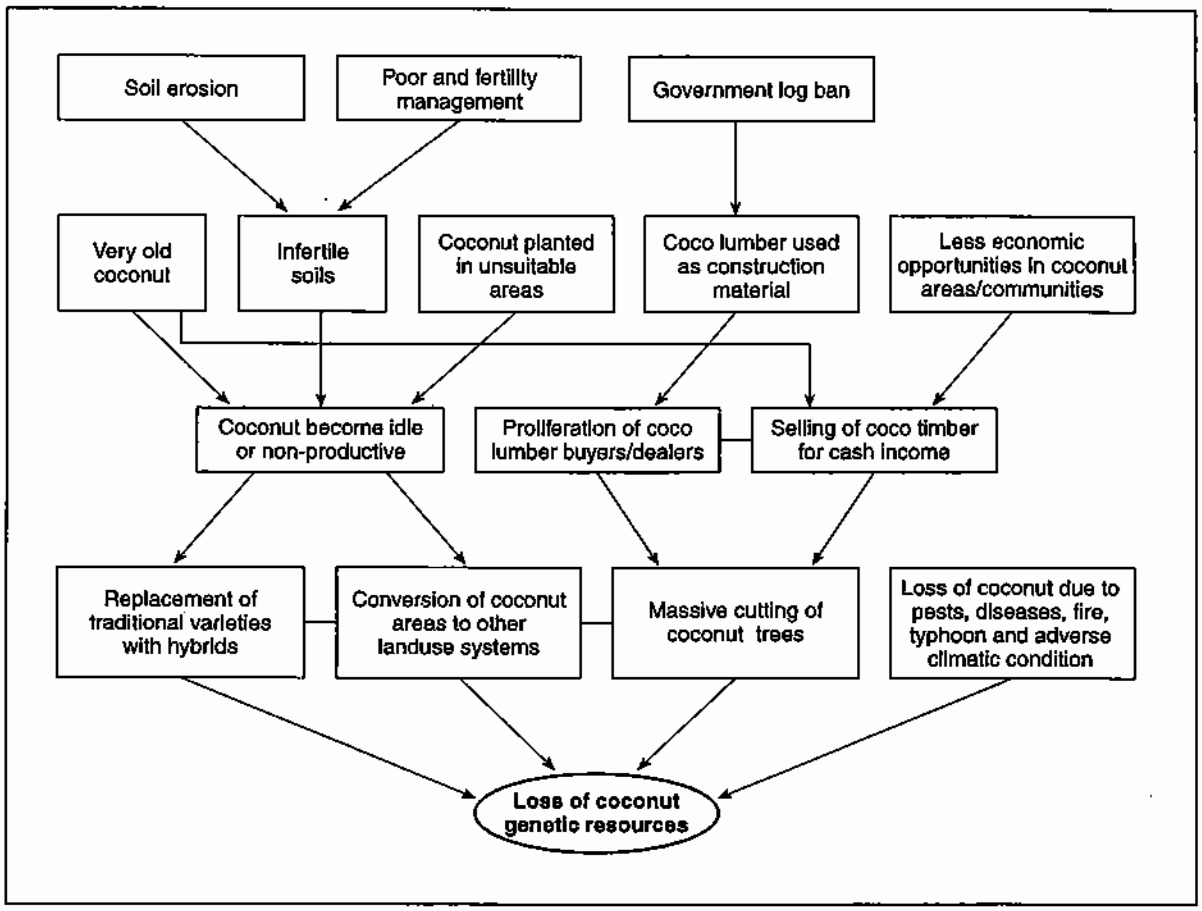
The construction boom in the Philippines has increased the demand for lumber in the last decade. Coconut has been identified as an excellent alternative source of the much-needed lumber for household and industrial construction needs. The urge to cut coconut trees for lumber and the proliferation of coconut lumber buyers and dealers have been triggered by the law on total ban on logging of forest trees in the Philippines. It was

only recently that the Philippine Coconut Authority controlled the massive cutting of coconut trees for lumber but the coconut lumber business has already inflicted tremendous damage to the coconut genetic resources. Most towns in the Philippines have 2-5 coconut lumber buyers and dealers. The chainsaws which were banned in forest logging have found their way into coconut lumber business. The few economic opportunities in the rural areas have also pushed the farmers to sell their coconut palms, including some productive ones, to lumber processors.

Loss of coconut due to pests, diseases, fire, typhoon and adverse climatic condition

Coconut farms are vulnerable to fire especially those with *imperata* grass. Islands facing the Pacific Ocean like Samar and Leyte are typhoon-prone areas where coconut trees are routinely cut and uprooted by tropical storms. The long drought brought about by the El Nino has inflicted great damage to coconut farms. Pest and diseases in coconut are the other causes for the decrease in the population of local tall varieties. It is noted that only a few farmers are replanting coconuts using the local tall varieties.

Figure 1. Conceptual framework of the problem on the loss of locally adapted tall coconut varieties in the Philippines



Use of participatory approaches in the South Pacific

Anare Macedru
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Introduction

Participatory Rural Appraisal workshop for the northern division extension officers was conducted at the Taveuni Coconut Centre (TCC). The aim is to establish the contribution of agriculture in the socioeconomic development of the people of Taveuni. The objective is to determine farmers' selection of different crops (such as taro, kava and coconut) which satisfy their socio-cultural and economic need since agriculture contributes significantly to the functioning of both socio-cultural and economic systems of the local people throughout the Pacific. The workshop focused on maximizing the usage of coconuts at a regional level.

My paper is entitled "The use of participatory approach or participatory-based development approach in the South Pacific region: intra household variations of the rural societies in the South".

The contents comprise of participation and its origin, diffusion of PRA as a development tool in the Pacific, labour divisions in a rural household setting, and some findings from the previous PRA exercise in Taveuni as a supplementary source of information for deliberation.

Agriculture in Fiji today

Agriculture remains the mainstay of Fiji's economy, accounting for 43% of export earnings, providing nearly 50% of the nation's total employment and contributing 20% of the Gross Domestic Product (GDP) (MAFF Annual Report 1996). Fiji's total land area is 1.8 million ha. However, only 16% is suitable for farming. Of the arable land, 24% is for sugar cane, 23% for coconut and the remaining 53% for other crops.

Copra and coconut oil

Copra production increased from 8400 tonnes in 1994 to 10 700 tonnes in 1995. This was largely attributed to the increase in average millgate price which rose from $345.21/t in 1994 to $368.76/t in 1995, with $550-$600/tonne in current price. With the continued price increase, the outlook for 1997/98 looks promising (Fiji today 1997).

Agricultural problems in Fiji in relation to PIC

Fiji and other South Pacific countries have a lot of things in common. They share the same tropical climate and limited land resources (mostly small countries except for Papua New Guinea). Agriculture, in general, is the backbone of the economy except for some countries in the region, which have a mining-based economy.

Our traditional cropping systems are village-based and we grow and cultivate the same crops such as taro, kava, coconuts, breadfruits and banana. We have similarities in our mode of production as well as our economic policies, and we also share common development problems.

In Fiji, and other countries in the Pacific, agriculture continues to be the mainstay of the economy. In Fiji's economy, agriculture, fisheries and forests account for 43% of export earnings, providing around 50% of employment and contributing 20% GDP (MAFF Annual Report 1996).

An important aspect is to try to identify where conflicting goals and objectives may arise between the household and the introduced economic system.

If the government prepares an action plan without consulting and understanding how the household or community system operate, the rural household may not be willing to accept change.

Labour profile

A Rapid Rural Appraisal (RRA) exercise conducted at the central division of Fiji (Bachmann et al 1995) discovered that farm household varies from two to ten members. Male farmers work around six to seven hours in agriculture daily. Settlement farmers work about one hour longer. Women work around 7-9 hours daily and spend about 1/3 of their time on agricultural activities. In addition, (Macedru et al 1996) a similar survey conducted in another farming village in Fiji, found that women, apart from routine activities of preparing breakfast, lunch and dinner and washing clothes, are also involved in food production system as well as the economic system of the family. Women weed the garden, apply fertilizers and harvest foods, from both on and off farm sources, from Mondays to Wednesdays and again are responsible for marketing farm produce from Thursdays to Saturdays. They also attend to cultural and religious activities.

The pattern is similar throughout the region. Women's contribution to both subsistence and economic activities is substantial. Census estimates that subsistence activities are higher in countries where women are customarily engaged in agriculture. In Papua New Guinea, for example, in 1990, over 50% of the women are engaged solely in agriculture compared to only 33% men. Similarly in Vanuatu, 1991, census recorded as much as 84% of the women are engaged in agriculture. In countries where women's traditional involvement in agriculture has been less extensive, significant increase in their agriculture work appears to be emerging. In the Cook Islands, for example, 10.2% of the women are self employed in the subsistence sector and 15% are engaged in agriculture and fisheries compared to 17% and 35%, respectively, for men. In the ginger industry in Fiji, women labour demand is high during planting and maintenance, weeding and harvesting. During harvesting, women labour is needed to uproot the plant, trim, clean and grade before marketing. Household labour can pack 50 cases of ginger per day.

In addition, women are also the major informal traders throughout the region. They are seen as street and market vendors as well as sellers in the commercial outlets. If the self-employed category is used as an indicator of informal sector activity, then almost one quarter of Pacific women are engaged in the informal sector trade (Dunlop 1991).

The overall labour availability on farm household varied so largely that it was impossible to draw definite conclusions to when and where labour is a key constraint factor to increased agricultural production. The contribution of other household members is very variable and depends largely on age and off-farm income opportunities.

Table 3: Average time (hours) spent weaving by women from three Samoan villages

Age	Rural	Peri-urban	Urban village
25 – 34 years	4.93 (n=8)	3.81 (n=0)	0 (n=0)
35 – 44	6.92 (n=7)	9.75 (n=2)	4.33 (n=6)
45 – 54	11.50 (n=8)	11.0 (n=6)	1.00 (n=3)
55+	7.62 (n=8)	14.56 (n=6)	12.00 n=1)

Source: (Fairbairn-Dunlop 1991)

Conclusion

Participatory-based development approaches have been an integral element of indigenous activities in the past. In traditional Fijian communities, working together communally in a participatory manner used to be the mechanism of getting things done, particularly in building houses in the village, as well as farming.

The invasion of the traditional settings by modernization philosophies and socioeconomic pressure to the capitalist model of production, has dismantled or diluted, to some extent, the base of the traditional systems of production and getting things done through communal means.

When the Green Revolution technology failed to promote agricultural development in some Third world countries, development practitioners have reverted to alternative development approaches based on participation, putting farmers and community in the driving seat and empowering them to be responsible for their own development.

In promoting participation in the "Putting People First" programme organized by the United Nations Development Programme (UNDP), it was identified that in order for the people in the South Pacific region to achieve a higher level of economic and social development, people should be allowed to be responsible for their own development.

Promoting participation means empowering people with information and skills, allowing them to have greater access to resources and opportunities. At the highest level of participation, the concept of empowerment is internalized, and people begin to take control over situations that affect their lives.

Finally, on the intra house variations of the rural society, although the overall labour availability on farm household varied so largely that it was impossible to draw definite conclusions to categorizing responsibilities, it is obvious that women are the backbone of the family. Their contributions are, however, rarely recognized.

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Examples of coconut characters influenced by above factors
- earliness (important for new plantation, plantation costs are high) - cf. dwarf varieties
- length of productive life
- regularity of production

Location, sizes and number of stands

Coconuts grown in a homegarden and those in a monocrop stand located further away from the house usually do not receive the same amount of care and are not expected to give the same products. Those close to the house can be harvested on a daily need basis, and can benefit from organic fertilizers. The size and number of coconut stands are also important for the potential diversity of coconut types grown, particularly if they are found in various microenvironments.

Location, sizes and number of stands
- location of stands (proximity to house linked to intensity of care/organic fertilizers/ harvesting frequency)
- size and number of stands

Examples of characters
- quick germination of nuts (unfavourable if low harvesting frequency, i.e. crop left on the ground for a long time - case of distant stands)
- level of dependence on fertilizers (high for hybrids)
- adaptation to specific microenvironments (soil, drought)

Adaptation to environment

Environment factors such as pests and diseases, drought, and specific soil conditions influence the choice of germplasm. Local ecotypes are well fitted to their specific environment and will require minimum control methods, whereas other types may be more productive but more susceptible to pests, etc., necessitating in more intensive care or more input, which are not always available.

Adaptation to environment
- prevailing diseases, pests and weed (*Imperata*) - control methods
- *available/applied*
- prevailing stress: drought, cold, wind (cyclones)

Examples of characters
- resistance to all above factors
- strong root system linked to wind resistance

Crop management

In addition, the level of care that can be devoted to the crop might condition the choice of a more or less demanding type in terms of various aspects of crop management such as fertilizing, weeding, and harvesting.

Cultural practices and crop management
- fertilization needs
- harvesting frequency
- harvesting methods

Setting the mode of the dialogue

1. Welcomed by farmers' leader.
2. Explanation as to the purpose of the study.
3. Getting to know each other through self-introduction by farmer and participants.
4. Ice breaker in terms of a song (birthday song).
5. Explained to the group that it was an informal discussion for exchange of information and that farmers were free to ask question at any time.
6. Rex gave the tape recorder to the farmers' leader telling him that if he felt what was being discussed should be off the record, he can just turn it off.

Community consultation proper

Field observation

Community validation – 2 hectares

Methods used	Mode
1. Community dialogue	Since most of the farmers could not speak English, the plan for Rex to lead the dialogue was put off.
2. Key informant interview	Was most effective when topics on coconut-based integrated farming portion was discussed.
3. Field visit	Validation of the information given by farmers.
4. Mapping	Was done with a farmer to elicit information on their concept of village infrastructure.

Reasons given by farmers for choosing Laguna variety over the other two (2) varieties

1. Palms produce 14 -16 bunches.
2. Nut size is big.
3. Only 3.2 nuts are needed to produce 1 kg of copra. On average, 4 -5 nuts are needed to produce 1 kg of copra.
4. Tolerant to bud rot diseases.
5. Young tender nuts have a large volume of water. Water is also sweet.
6. The yield of toddy is high.

Some farmers pointed out that in all the gardens where Laguna Tall is grown, there are few palms which show superior characteristics in crown shape, number of leaves and inflorescences produced, number of nuts and copra content per nut and in the regularity of bearing. In the garden of one farmer, 15-20 such palms, among a total of 140 palms, were identified. This observation is important, as it would be necessary to identify and study the characteristics of such superior palms. These palms can constitute a desirable germplasm for further multiplication in order to serve as the material for varied uses.

Coconut stakeholder analysis on Bangladesh

Prepared by workshop's participants

Who are the coconut producers and what is the average size of holding?

The producers of coconut are households, small and marginal farmers, and the larger orchards. The average size of holdings is small, while some farmers are also landless.

Where is coconut grown and with what other crops?

Coconut is commonly grown around the household, but orchards are common in the coastal belt. Coconut is grown in association with fruit trees (including jackfruit, mango, and guava), turmeric, ginger, betel nut, and various vegetables.

What are the uses of coconut?

Coconut is grown for both commercial and non-commercial uses. Both the green tender nuts and mature nuts are sold at market, as are leaf midribs for broom making, and nut shells for making spoons and *hookahs*. Husks are sometimes used to make cushions and decorative materials.

There are many domestic uses for coconut. The water of tender coconuts is used for drinking, cosmetic and medicinal purposes. Various parts of the tree are also used to create mattresses, coir fibre, oil for cooking, fuel or firewood, building materials (for bridges or stairs), spoons and for other domestic uses. Both mature and young nuts are also used for religious purposes.

What are the affects of cultural change on the use of coconut?

Rural people use coconut fruits and other parts of palm for multiple purposes. Urban people hardly use coconut but they are conscious about the nutrients of coconut water and copra, so they would also consume it when needed.

What are the common agronomic practices, as well as the time allocation and input use for coconut production?

Household cultivation of coconut is done without the use of fertilizer. There is normally some clearing done at the top of the palm, as well as mulching and earthing up.

For small households, very little time is allocated to coconut production, while managers of small orchards allocate only about 10-15% of their time, and for larger orchards 30-40%. Inputs used on coconut include fertilizers and pesticides, and irrigation. Fertilizer is used only occasionally after the rainy season.

What are the common patterns of tenure, household decision-making and access to resources?

Land is owned mostly by individuals. Household decisions are made mostly by men in consultation with their wives and other family members. Farmers normally receive their resources from farm income and other sources, as well as bank loans.

Reports from semi-structured interviews

Men's Group 1

Group 1 interviewers
Mr. Amzad Hossain
Mr. Azizur Rhaman

Interview participants

Name	Age	Education	No. family members	Occupation
Md. Gias Uddin	45	H.S.C.	7	farmer
Md. Sharafat Ali Khan	20	B.Sc.	10	student
Md. Sarder Ali Khan	78	Primary (3)	12	farmer
Md. Motaleb Khan	35	S.S.C. (2)	4	farmer
Md. Sheik	65	Primary	8	farmer
Mr Noor Mohammed	30	no education	3	farmer
Mr Abu Taher	16	S.S.C.	3	student
Md. Wase Uddin Khan	60	no education	8	farmer
Md. Joynal Abedin	42	S.S.C.	4	village doctor
Md. Ramiz Uddin	45	no education	5	farmer
Md. Taizuiddin Akanda	35	no education	7	farmer
Md. Lehaz Uddin	38	no education	4	businessman
Md. Borhan Uddin Khan	19	H.S.C.	9	student

1. H.S.C. - Higher Secondary Certificate (12 years schooling)
2. S.S.C. - Secondary School Certificate (10 years schooling)
3. Primary - up to five years schooling

Address of the location
Village: China Sukhania.
Post Office: Vaowal Raja Bari.
District: Gazipur, Bangladesh.

Location
The village of China Sukhania is situated 20 km north of BARI, Joydebpur.

Area and population
The village is 6 sq km, 3 km long and 2 km wide. There are about 5000 villagers.

Historical background
There is an old, abandoned palace near the village where a king once resided in 1914. There are also two big ponds beside the village named Doinna and Megher. The deep trench around the palace was constructed by the king as protection from the enemy. During the Liberation War of Bangladesh in 1971, the Pakistani soldiers made a military camp in this village but no destruction occurred.

Occupation
Most of the people of the village (about 80%) are farmers, and derive their livelihood from agriculture. Some other people are engaged in business, labour service (in country and abroad), rickshaw pulling, daily labour and others. About 5% of the people of the village are landless, and only own houses.

Source of income and industry

The main source of income is from agriculture and then business and service. Some families have small-scale poultry and fish farms.

Crops grown

The major crop is rice followed by wheat. Fruit is produced abundantly and surpluses are sold in other districts. Fruits including guava, banana, litchi, coconut, mango and papaya are also produced in farmer households. Many vegetables are cultivated in the kitchen gardens of the farmer, such as potato, brinjal, pepper, beans, bottle gourds and others. There is, however, no commercial cultivation of vegetables. Other cash crops include bamboo. There are also some trees planted including teak and mahogany.

Seed source

Most of the seeds are supplied from farmers' own production. Sometimes farmers buy seeds from market and neighbouring nurseries.

Land and soil type

There are two types of land: low land and high land. Generally, rice is cultivated in low land areas where the soil type is loam and sandy loam. The high lands are used to build houses, cultivate vegetable and fruit gardens. The soil type of the high land is clay (red laterite soil). In 1998, a deluge occurred and most of the houses of this village were inundated, causing the death of many jackfruit and some coconut trees.

Cropping pattern

The farmers generally practice monocrop culture of rice or wheat. Although they do not practice intercrop, they do cultivate fruit trees and forest trees, and vegetables in association with coconut near their homestead.

Education

About 50% of the people in the village are literate, and out of these, 14% are women. There is a girls' high school and two primary schools in the village.

Labour and decision-making

Generally, farmers labour in their own fields. However, during the harvesting season, labourers are hired from other districts. There are no female labourers in the field. Men do most of the decision making. But educated families do consult with the whole family before making decisions.

Information about coconut

Farmers identified three coconut varieties in this village: local (Deshi) Chandana (Sri Lankan) and Baro Daiga (Malay Yellow Dwarf). This village has no separate coconut gardens. Coconut is grown with other fruit trees beside farmer households. Only 25% of the farmers own coconut trees. Most of the adult coconut trees do not bear regularly. Some of trees are stunted. The main reason for these problems is that farmers do not use fertilizer or manure and there is no irrigation, draining, mulching or other beneficial practices.

Generally, farmers harvest coconut at the mature stage, but occasionally they harvest in the green stage for their own purpose and to entertain guests, or for sale in the market. Mature nuts are generally used to fulfil household needs; for making sweets, cakes, and other foods. The years when production is high, mature nuts are also sold in the market. Sometimes, poor families sell all of their nuts in the market.

Coconut seedlings are collected from farmers' own production and from other neighbouring farmers. Generally, there are no high yielding varieties (HYVs) and there

is no local nursery which sells HYVs. Therefore, the existing coconut trees are the main source of seedlings. Due to the low yield of locally grown varieties, the average number of nuts per year per tree ranges between 20-30.

The major problems of coconut cultivation are the lack of capital and HYVs, fruit dropping, fruit cracking, pests and diseases. Farmers do not know how to care for the coconut trees, how to fertilize and irrigate them and steps which could help to increase yield. There is a bright prospect for coconut cultivation in the village because one pair of mature nuts is sold at TK 20 and one pair of seedlings is sold at TK 40. Farmers are interested in coconut cultivation. If we could overcome the constraints and provide the facilities, they could successfully grow coconut as a cash crop.

Men's Group 2

Group 2 interviewers
Md. Nazirul Islam
Md. Sayedur Rhaman

Interview participants

Name	Age
Abdul Kader	35
Jamal Uddin	50
Kamar Uddin	55
Hafiz Uddin	40
Mohammad Ali	45
Abdus Shahid	38
Gowranga Chandra Das	30
Alhaz Md.	–
Asifuddin Khan	60

The name of the village is China Sukania under the Sreepur Thana at Gazipur District. The village has an area of 6 sq. miles, and a population of 5500. The east and west side of the village are surrounded by two rivers, named the Sutti and Paruli, respectively. Two villages, namely, RazaBari and Nalgaon, surround the other sides (i.e. the north and south). There are 11 mosques, four mandhir, two primary schools, one girls' high school, and four madrasha located in the area. Ninety percent of the villagers is Muslim and the remaining 10 percent is Hindu. About 50 percent of the villagers are involved in agriculture, 40 percent in general service and the remaining 10 percent in business. The literacy rate of the village is 60 percent. Among the 40 percent of the local population that holds civil service jobs, 6 percent are female.

The major crop grown in the area is paddy rice. Other crops include fruits such as jackfruit, coconut, guava, litchi, and papaya. Some vegetables were also cultivated in the village. Coconuts are grown mainly in the homestead areas.

Women's group

Group interviewers
Ferdhouse Islam (Ive)
Md. Zashim Uddin

Interview participants

Name	Age	No. of children
Ms Kadban	28	7
Ms Kulsum	31	4
Ms Fatema Bibi	21	8
Ms Sumala Begum	38	no children
Ms Rajia Begum	22	4
Ms Forina Begum	23	4
Ms Hosniara	20	2
Ms Rabeia	19	1
Ms Pink	33	5
Ms Farida	23	2
Ms Mazeda Begum	38	widow
Ms Tarlima	19	1

Other women who are not listed came and went from the group. The age range of the participants was 18-45 years. Most of the women have not had any education, though some of been educated to the level of higher secondary school. Most of the women are housewives.

Involvement in agriculture

Homestead gardening (vegetables and fruits), threshing, winnowing, storing, and small scale nursery management.

Household activities

Child rearing, taking care of other family members, cooking house cleaning, mat weaving, broom making, spoon making from coconut shell and other activities for home consumption and income generation.

Role in decision-making

Some times women make decisions for the planting of trees and convey this decision to their husbands. The husbands of the women also make decisions in consultation with their wives.

Ranking and scoring matrices

Matrix 1. Coconut parts and their uses

Men's Group 1

Parts	Uses	Score	Rank
Root	Fuel	2	7
Stem	Building	8	2
	Fuel	2	7
	Stair	4	5
	Bridge	6	3
Bark	Fuel	2	7
Leaves	Fuel	5	4
	Broom	10	1
Nuts	For eating	10	1
Mature nuts 60%	Income	2	7
	Making curry	1	8
	Fuel	3	6
	Cooking spoon	1	8
Green nut 40%	Drinking	10	1

Men's Group 2

Parts	Uses	Score	Rank
Root	No definite use	–	–
Stem	Housebuilding materials	9	2
	Firewood	2	7
	Stairs	5	5
Bark	Limited use – fire chips	1	8
Leaves	Broom	1	8
	Mat	10	1
	For fuel	2	7
	Used for covering (roofing) a house	10	1
Nuts	Drinking water	1	8
	Consumed	1	8
	Used as cooking material	3	6
	For processed foods	10	1
	Hair oil	2	7
	Coconut shell for cooking spoon	8	3
	Husk as fuel	9	2
	Husk as cushion	1	8
	Religious use	1	8
	Tender coconut for drinking water	6	4
	Matured coconut	9	2

Women's group

Parts	Uses	Score	Rank
Root	Fuel	10	1
Stem	Wood for house-making	8	2
	Bridge	1	9
	Fuel	9	1
	House-making beam	4	5
	Fuel	7	2
	Sweet foods	8	1
	Spoon	5	2
	Pitcher cover	3	4
	Fuel	4	3
	Drinking for diarrhoea, fever	5	2
	Fuel	9	1
	Mat	5	3
	Fencing	3	4
	Broom	8	2

** These scores were based on the interviewer's interpretations of participants' responses. In workshop discussions, it was decided that in research sites where a numerical scoring system is not clearly understood by the participants, another type of scoring system should be used. One suggestion of a scoring system which could be used in future exercises, particularly with illiterate groups, are scores of high-medium-low use. This problem was not encountered with the other groups.

Matrix 2. Coconut varieties and their characteristics

Men's Group 1

Varieties → **Characteristics ↓**	Deshi (Local)	Chandaina Red	Chandaina Yellow	Chandaina Brown	Baro Daiga (Malay dwarf)
No. of nuts	5	4	2	2	3
Nut size	5	4	3	3	1
Plant height	5	4	3	3	1
Early bearing	3	4	4	4	5
Quantity of water/nut	5	4	4	4	2
Taste of water	3	4	4	4	5
Length of leaf	5	4	4	4	2
Nut without husk	5	3	3	3	2
Thickness of copra	4	5	5	5	2
Quantity of copra/nut	5	4	4	4	3
Taste of kernel	3	4	4	4	5
Fruit retention	5	4	4	4	3
Resistance to storms	3	4	4	4	5

Men's Group 1

Varieties → **Characteristics ↓**	Deshi	Chandaina Red	Chandaina Yellow
Plant height	3	2	1
Colour as tender coconut	Green	red	Yellow
Size of nuts	2	3	1
Taste of water**	-	-	-
Taste of kernel	3 (good, sweet)	1 (less sweet)	2 (medium sweet)
Quantity of copra/nut	2 (medium)	1 (medium)	3 (high)
No. of nuts/tree	2	1	3

** Participants said they did not distinguish between the taste of the water of the different varieties.

Women's Group

Varieties → **Characteristics ↓**	Deshi	Chandaina Red (red & yellow)	Baro Daiga
Plant size	Tall	Tall	Dwarf
Green nut color	Green	Red and yellow	Light red
Early bearing habit	Medium early	Medium early	Early
No. of nuts	50-60/year/plant	100-150/year/plant	100-150/year/plant
Nut size	Large	Medium	Small
Taste of water	Sweet	Very sweet	Normal taste
Taste of fresh kernel	sweet	Very sweet	Normal

Matrix 3. Constraints on coconut production (Pairwise ranking)

Men's Group 1

Problems	Fruit drop	Insect pests-rhino beetle	Vertebrate pests**	Disease (Stem-bleed)	Fruit crack	Lack of capital	Lack of HYVs	Barren nut	S	R
Fruit drop	X	Fruit drop	Fruit drop	Fruit drop	Fruit drop	Lack of capital	Lack of HYVs	Fruit drop	5	3
Insect pests-rhino Beetle		x	Vertebrate pests	Insect pests	Insect pests	Lack of capital	Lack of HYVs	Barren nut	2	5
Vertebrate pests			X	Disease	Fruit crack	Lack of capital	Lack of HYVs	Barren nut	1	6
Disease (stem-bleed)				x	Fruit crack	Lack of capital	Lack of HYVs	Barren nut	1	6
Fruit crack					X	Lack of capital	Lack of HYVs	Barren nut	2	5
Lack of capital						x	Lack of capital	Lack of capital	7	1
Lack of HYVs							X	Lack of capital	6	2
Barren nut								x	4	4

** Vertebrate pests include squirrel and fruit bat.

Men's Group 2

Problems	Climate	Insect Pests – Rhino Beetle	Lack of HYV	Lack of approp. Tech.	Lack of extension	Unknown soil needs	Lack of Inputs	Cultiv. practice	S	R
Climate	X	Insect pests	Lack of HYV	Lack of approp. tech.	Lack of extension	Soil needs	Lack of inputs	Cultiv. practice	–	–
Insect pests		X	Lack of HYV	Lack of approp. tech.	Lack of extension	Soil needs	Lack of inputs	Cultiv. practice	1	7
Lack of HYVs			x	Lack of approp. tech.	Lack of HYVs	Soil needs	Lack of HYVs	Lack of HYVs	5	3
Lack of approp. tech.				x	Lack of approp. tech.	Soil needs	Lack of app. tech.	Lack of approp. tech.	6	2
Lack of extension					X	Soil needs	Lack of inputs	Cultiv. practice	2	6
Unknown soil needs						X	Soil needs	Soil needs	7	1
Lack of inputs							X	Cultiv. practice	3	5
Cultiv. practice								X	4	4

Women's Group

Problems	Fruit drop	Insect pests	Vert. pests	Fruit cracking	Capital	Lack of HYVs	S	R
Fruit drop	X	Fruit drop	Fruit drop	Fruit drop	Capital	Lack of HYVs	3	3
Insect pests		x	Insect pests	Insect pests	Capital	Lack of HYVs	2	4
Vertebrate pests			x	Vertebrate pests	Capital	Lack of HYVs	1	5
Fruit cracking				X	Capital	Lack of HYVs	0	6
Capital					x	Capital	5	1
Lack of HYVs						X	4	2

Highest ranked problems

Men's Group 1

1. Lack of capital
2. Lack of HYVs.
3. Fruit drop

Men's Group 2

1. Unknown soil needs
2. Lack of appropriate technology
3. Lack of HYVs

Women's group

1. Capital
2. Lack of HYVs
3. Fruit drop

Women's focus group (discussing coconut seedling). China Sukhania Village, Gazipur, Bangladesh. Dec. 9, 1988.

Men's focus group (seeking hookah made from coconut). China Sukhania Village, Gazipur, Bangladesh. Dec. 9, 1988.

Workshop participants. Bangladesh. Dec. 10, 1988.

Farmer participatory research methods for Solomon

Overview

The Farmer Participatory Workshop on Coconut Diversity that was conducted in the Solomon Islands, from 30 Nov - 2 Dec 1998, was preliminary to the actual implementation of the IPGRI Farm Participatory Project on Coconut Diversity for the Asia Pacific region. The IPGRI project "Sustainable use of coconut genetic resources" aimed at enhancing both the income and nutrition of smallholders in the Asia and Pacific region. Component one of the project is the farmer participatory survey to identify multiple uses of coconuts, varieties suitable for these uses and production constraints.

The workshop in the Solomon was to train the local core team on the use of Participatory Rural Appraisal (PRA) methodology to be able to implement IPGRI project components.

Overall objectives

- To review and apply the state of the art methods on participatory research with farmers to the case of coconut genetic resources.
- To identify key areas where participatory research methods enable both farmers and coconut researchers to locate and maintain useful characters and diversity in coconut.
- To develop strategies to add value to diverse coconut genetic resources by improving the uses and sources of germplasm.
- To develop protocols for participatory and multi-disciplinary coconut research and conservation activities in participating coconut-producing countries

Outputs

- A menu of methods which participants can use jointly with farmers in the Solomon to access coconut diversity and its uses.
- A template to compare farmers perceived and managed coconut diversity with coconuts genetic resources available from coconut research and germplasm programmes, resulting in a more complete and holistic identification of useful coconut diversity.
- Coconut germplasm strategies that link research station and genebank genetic resources with coconut ecotypes in local farming systems to provide greater range of coconut diversity to support ecotypes in local farming systems, a wider range of coconut products and add value to the coconut production.

Methodology

One of the essential components in development is the empowerment of people to participate fully in the decision and the process that shape their lives. Critical in this development approach and in particular the IPGRI project, is the application of Participatory Rural Appraisal (PRA) to enable both farmers and coconut researchers to locate and maintain useful characters and diversity in coconut.

Main findings from the field survey

Main economic crops

Sweet potatoes is ranked very high in their list of economic crops followed by green and matured coconuts sold in the local markets, peanuts and vegetables, and small livestock such as pigs and chickens.

Copra production is not common in the village because it is not economical. Only large producers produce and export copra.

Land tenure and coconut ownership

Land in the community is not individually owned but owned by the tribe through matrilineal lineage. However, coconut trees in the village are individually owned.

Why do they grow coconuts?

Both men and women gave highest ranking for food, and then green and matured nuts for income and leaves for broom. Men also gave very high ranking for animal feed. Copra is of little importance to the community (Table 3).

Coconut parts and their uses

The women have a lot of uses from all coconut parts, from the roots to the leaves while men did not give any use for the roots. Nut and leaves are of many uses. Coconut leaves are mainly used for household uses while nuts are used mainly for food. Copra is ranked very low in the men's group and not mentioned in the women's group (Table 4).

Characteristics for different coconut varieties

Both men and women have identified nine varieties of coconuts grown locally but both the men and women gave different names to some. The men have identified 17 different characteristics while the women came up with 19 characteristics.

Varieties such as Niu Kou, Niu Magata, Niu Sisi and Niu Bolu are existing coconut varieties that score highly in the women's group. Niu Kou was identified by MAFF as Solomon Tall.

For men, varieties such as Ni Poposa, Niu Sisi and Niu Magata all stand out with their characteristics. Niu Poposa was identified by MAFF as Solomon Tall and Niu-Sisi as cultivars of Solomon Tall (Table 5).

Intercropping with coconuts

It is common for cocoa to grow well under coconuts. During the transect walk, it was noted that coconut is grown as monocrop.

Constraints

According to the men, land dispute is the main constraint in coconut development, followed by the lack of knowledge, and weeds. The women put bad weather as their biggest constraint, followed by pest and market price.

Training venue

The training was based at the Dodo Creek Research Station, Honiara while the field practicum was conducted at Komubeti village, located about 10 km from the research station.

Next step

The implementation of Component 1 under the IPGRI Project.

Component 1

Farmer participatory survey to identify multi-purpose uses, varieties suitable for these uses and production constraints to enhance farmers' income.

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Day One (Monday, 30 Nov 1998)

The unavailability of teaching aid such as an Overhead Projector (OHP) in the training hall on the first day caused some disruptions to day one activity. While efforts were made to get an OHP to help us in our presentation, since our training materials are on transparencies, necessary alterations to day one programme were made in preparation for the field practicum the next day.

Programme

1. Farmer participatory tools for crop and tree diversity and discussion.
2. Introduction to participatory tools (Part 2).

The two topics were merged in the morning of day one. Different PRA tools were introduced to participants followed by a discussion session. The following PRA tools were introduced to the participants in the morning.

Semi Structure Interview (SSI)
Information required:

- History of the village
- Number of households in the village
- Village populations
- Main source of income
- Main crops grown by the community
- Market opportunities
- Coconut diversity
- Land tenure system

Matrix ranking and scoring
The matrix was used to determine:

- Uses of coconuts
- Coconut parts and their uses
- Different varieties of coconuts and their characteristics

Pairwise ranking
The Pairwise ranking was used to identify coconut development constraints.

Transect walk
Land use, vegetation, soils types, problems and opportunities.

Diagramming (venn, flow, bar)

Seasonal and labour calendar

Time trend

Mapping (community historical mapping and village mapping)

Participants observations (proxy indicators)

Available information (secondary data)

Local knowledge

Logic decision tree

Afternoon programme

Participants were divided into groups, four participants into two groups of two. Each group was supplied with Butcher papers and pens, and practiced the use of selected PRA tools for the practicum.

Each group practiced the use of SSI and Matrix to determine the uses of coconuts, coconut varieties and their characteristics, and uses of different parts of coconut. The Pairwise correlation matrix was used to determine coconut development constraints. Each group did their own analysis and presented their findings from the matrix on the three research topics identified and development constraints from the Pairwise correlation tool.

Pre-practicum preparation

Groups

Two teams were identified for the field practicum. Amanda joined the women's group while I was with the senior men's group.

Materials

All materials required for the practicum exercise were made available to each group and each group team leaders were given the responsibility to see that they have enough papers and pens for the field exercise.

Village briefing

Michael Max briefed the participants about the community that will be visited and why the community was selected

Day one programme was completed at 5.00 p.m.

Day Two (Tuesday - 1 Dec 1998)

Field practicum

Background information

Prior to our going to the village, the participants were briefed with background information on the community that we will be visiting.

Community/Village - Komubeti

Participants arrived in the village at about 9.00am. It took us about 15 minutes by car. The community was already divided into one women's group and a senior men's group.

Tool 1: Semi structured interview

History of the Komubeti village

Most of the village members are originally from Haimaki, located near the sea. After a damaging cyclone in 1967, they moved inland. A man named Peter started the village, settling in the near vicinity. In 1979, others moved to the new village.

Current number of households and population

Komubeti currently has eight "families", and a total population of approximately 51 members. There are seven main buildings in the village. (All families are Anglicans except one which is Catholic).

Income generating crops

The highest income comes from the sale of *kumara* (sweet potato), and both green and mature coconuts. Also sold are peanut amaranthus, white beans of cocoa, vegetables such as cabbage and pumpkin, and fruits including watermelon and guava, and small

livestock including local chicken and pigs. Crops are sold at the main market in Honiara, and are transported there by truck.

Some coconut is sold for copra making. However, copra is not made in the village because there are no materials to dry the copra, and it is currently fetching a lower price relative to the sale of green and dried coconuts. One man gave a clear explanation:

sell 100 dried coconuts = 100 Solomon dollars
400 nuts (1 pint copra) = 40 Solomon dollars

Land tenure and ownership of coconut
The land of the village is customary land owned by the tribal ruler, and passed down through matrilineal inheritance. Coconut trees in the village are owned by individual families. While a certain member is responsible for its care, any member of the family may harvest from the coconut.

Tool 2: Matrix
Matrix 1: Why do you grow coconuts?
Matrix 2: Coconut parts and their uses.
Matrix 3: Characteristics of different varieties and their uses.
Matrix 4: Pairwise matrix to identify coconut development constraints.

Tool 3: Village mapping
A member of the village drew a sketch map of the village including houses, location of the river, road, swamps and coconut areas.

Tool 4: Transect walk
A group of villagers with the PRA team did a transect from the old village site near the sea to the current site, identifying changes in vegetation cover and varieties of coconut grown on different areas, land use system, different soil types and problems and opportunities. These are visible from the walk and through discussion with the community.

Day two programme was completed at 5.00 p.m.

Day 3 (Wednesday - 2 Dec 1998)

Programme
Morning: Data analysis and presentation of findings by individual group.

The process
Step 1- Survey data analysis and individual presentation
Participation was encouraged through out the programme. Each group pinned all their survey papers on the wall and analyzed their findings from each tool used during the survey from SSI, and the four matrices. Each participant had turn to present.

Step 2: Presentation of findings on our four research topics
- Uses of coconuts
- Coconut parts and their uses
- Different varieties of coconuts and their characteristics
- Development constraints

Data from each matrix from the women and men are put against each other for comparison and discussion. Participants were asked to look for patterns, differences, variations and contradictions. Findings on each topic were then presented by the whole group.

Afternoon programme

Use of participatory approaches to agricultural research and development examples from south pacific

Topics discussed include:

- The plan of operation of PRA. The activities required and sub-activities, timing, personnel, material and costs involved are presented in a table format.
- The thirteen steps involved in the implementation of PRA were discussed in steps from plan of operation to presentation of finding and formulation of action plan to improve the situation.

The use of PRA in tomato farming in Fiji

Contents include the selection of sites and respondents, analysis of problems related to tomato production, all seed related problems, analysis of seed problems related to tomato production, analysis of marketing problems of tomatoes, and analysis of major problem, overall importance of tomato varieties to Fijians and Indians, and their preferred vegetable varieties.

The use of PRA in project planning

The PRA tools are used in the four stages of the project cycle; at the planning, implementation, monitoring and evaluation stages.

The use of PRA in cocoa development in Fiji

This is to show the use of PRA tools in the descriptive survey to find problems related to cocoa development. Handouts were prepared and distributed to participants as reference and reading materials.

Stakeholders analysis – coconut production

Table 1. Coconut stakeholders' analysis – Solomon Islands

Characteristics	Smallholders	Large holders
Coconut producers (50,000)	80%	20%
Size of holding	Use small area of land: Average 2 ha.	Use large area of land: Average 1000 ha.
Coconut environment	Grown in coastal lowland and hills up to altitudes of 300 meters above sea level Grown in all local soil types, except on swampy soils Both monoculture and intercropping with cocoa, banana etc.	Grown in coastal lowland and hills, up to altitudes of 300 meters above sea level Grown in all local soil types, except swampy soils Both monoculture and intercropping with cocoa.
Coconut uses Commercial uses	Copra Green nuts Dry nuts	Copra Oil Feed Green nuts

Table 1. (Continued)

Characteristics	Smallholders	Large holders
Non-commercial uses	Food, drink Animal feed Posts, timber Mats Hats Kitchen utensils Firewood	Firewood
Traditional and cultural uses	Feasts Traditional ceremonies Kitchen utensils Strainers Medicine	N/A
Knowledge systems	Less technical know-how in rural areas Knowledge gained through practice passed down through generations	Advanced knowledge and technical know-how
Cultural change	Traditional values and uses are declining Coconut becoming increasingly important source of income New products or uses of coconut: toddy (Polynesian origin), hair oil, tea	N/A
Agronomic practices	Simple methods of planting No fertilizer No chemical spraying	Daily activity Use of fertilizer to increase production Use of chemicals for weed, pest, and disease control
Time allocation and input use	1 – 14 days Less labor input Less financial input Low agronomic input Ineffective use of input	Daily activity More agronomic input: fertilizer, chemicals, varieties, etc. Effective use of input
Household decision-making	Domestic production: women plantation management and copra production: men	Management
Land tenure	Customary land belonging to tribe Frequent land disputes	Registered land On lease
Access to resources	No finance for inputs No access to funding institutions Poor access to quality seeds Limited individual rights	Access to finance and funding institutions Access to large areas of land Good quality seeds

Day 4 (Thursday 3/12/98)

Morning programme: Write up of the field protocol for participatory characterization of coconut diversity and its uses in Solomon. The write up was done by the whole group and took the whole morning.

Table 2. Protocol

Methodology	How/Where to apply	Output
1. Research, RIPEL, CEMA, Extension – Min. of Ag., Nutrition – Min. of Health Team members Research: Max, Martin, Silas RIPEL: Patrick CEMA: Moses Health: Paulin Extension: J. Tahopa SIDT: Wale	Central Island Province; Choiseul (Pensbel & Ngella) Research – technology CEMA – marketing export RIPEL – genebank Health – nutrition aspects (1 day) meeting of all stakeholders (1 week) to form multi-disciplinary team	Team of stakeholders formed. Team made up of all stakeholders which include nutritionist, extensionist, plantation marketing, research and SIDT.
2. Team-building meetings and review of background information.	Consult maps of specific area. Consult earlier work done on coconut in Solomon Islands. Smallholders and commercial production, acreages etc.	Terms of reference for team members. Site for teamwork schedule agreed. Site for surveys agreed.
3. Community participatory diagnostic Communicate tools to extension services. Liaise with Extension service officers in respective islands to arrange meeting with communities concerned to implement PRA tools. Describe process, materials, purpose of the research, and intended application of results to the communities involved, and obtain community consent to proposed research. PRA	The steps will involve: • Semi-structured interviews • Focus group interviews • Transect walks • Matrix, ranking and scoring to take place at each site Work to prepare results and interpretation of results. Time needed: 30 days for research at 8 sites located on three islands.	Provide documentation of located coconut types: • Coconut diversity • Uses of identified local coconut types • Constraints to coconut production at each sites • Identification of potential threats to local cultivars

Table 2. (Continued)

Methodology	How/Where to apply	Output
4. PRCD in target communities Farmer participatory characterization of coconut genetic resources in field sites and communities. Socio-cultural description. Map germplasm sources, needs and local seed systems. Farmer agronomic trends. Land use systems and environmental change. Farmer assessment of trends and priorities for coconut improvement germplasm use (for tools refer to No. 3).	Coconut genetic resources survey and characterization in each site, sampling 25 palms for locally named varieties. Specialist interviews, within each community (focus-group interviews). Document briefly biophysical conditions, production, marketing, and processing trends. Review and allocation of interview and survey data, verification and crosscheck with communities. Time needed: 2 days	Field report and data containing: list of coconut cultivars and their uses per community; collected number of samples per coconut type identified; distribution and ranking of types; list of sources of germplasm for each type; analysis of impact of choices on maintenance and use of diversity; analysis of land use changes, farming systems and choices of coconut types; and coconut development options from the users and farmers perspectives.
5. Return results to community Describe findings of research, uses of community knowledge, as well as any intended follow-up actions. Description of coconut genetic resources and associated knowledge held by community. Description of the participants from the community and from research teams.	Record time, place, and focus of all interactions for each site. Prepare a special document of visual information for the communities to use as a record of their local knowledge and the coconut genetic resources they manage. The document should be: written in the local language; contain maps, graphs, charts and photographs; be accessible to all community members and suitable for display in public places.	A visually attractive, simply worded description of visits, materials, people and local experts. Contribution to communities' sense of ownership, prides, and value in their genetic resources and knowledge systems. Distribution and access to this document outside the community subject to the decision by the community.
6. Analysis of farmer information and genetic diversity data. Population data on coconut cultivars. Quantitative measures of genetic characters to assess relationship between coconut types. Relationship between socio-economy, cultures, and use of coconut diversity and genetic resources. Description of local germplasm management practices, choices and values assigned to diverse genetic resources.	Quantitative diversity measures applied to sample population for identified cultivars (see STANTECH and other source materials). Indicate relationships and range of diversity in coconut farming systems. Farmer decision-making matrices and diagrams and/or descriptions. Descriptions of socio-cultural practices and institutions associated with coconut diversity Time needed: 2-3 months	Database on coconut diversity in smallholder coconut-based farming systems. Dendogrammes on relationships between coconut cultivars. List of key factors and variables affecting farmer decision on the use of coconut genetic resources. Description of coconut based farming systems that maintain high levels of coconut diversity.

Table 2. (Continued)

Methodology	How/Where to apply	Output
7. Link farmer managed coconut diversity and uses to Research and Development (R&D) and conservation of genetic resources. Constraints analysis for use of coconut cultivars. Identify opportunities in coconut production systems to add value and exploit the potential of local cultivars. Identify farmer uses and preferred characters which can be included in coconut breeding and improvement.	Analysis of potential threats to coconut genetic resources. Decision tree on choices of coconut germplasm. Support and leverage points to support and enhance use of coconut diversity (throughout entire PGR production and use cycle). Conservation through use, *in situ* conservation and *ex situ* conservation: complementary strategies.	Priority actions for conservation and adding value to coconut genetic resources. Decision making model to understand and support farmer management and use of coconut diversity. Germplasm enhancement and improvement activities better targeted to the needs of smallholders. Adding value to coconut genetic resources by improving linkages to uses and expanding uses. Integration of coconut research and development with conservation and biodiversity management.
8. Dissemination and future follow up. Share results with NARS coconut improvement and genetic resource programs. Link with other projects affecting coconut smallholders including other IFAS and ADB projects. Develop new action and proposals to create new income opportunities for diversity-rich coconut products.	Link with: research, extension, CEMA, farmers NGOs, commercial plantations, policy makers and decision-making bodies with the government and other organizations, in order to develop: • On-farm conservation projects. • Diversification of coconut products to earn higher income and to be supported by natural programmes and partners. • Public awareness of coconut diversity and coconut-based farming systems as a viable tool for household food security and income.	Information sharing and coconut diversity. Scientific paper. Extension document. Educational materials. Public awareness (field day). Posters. Recipes, medicinal and craft uses.

Recommendations

- In order to promote empowerment and participation of the local people, a member of the community should be included in the IPGRI coconut project team, in particular, Component 1.
- Three days of PRA training was too short especially for first timers. Four to five days is recommended.
- It is only a descriptive and topical PRA at this stage. The four participants that were trained, are in a position and capable to do their own PRA exercise.

Conclusion

After conducting our own evaluation of the three and a half days programme, results have shown positive indications that the participants have acquired the knowledge and skills, and are confident to apply the tools, analyze the data and present findings on their own.

Although there were some changes made to the original programme, it was only the timing but not the topic. Handouts of the presentations were given to participants as reading and reference materials.

At the end of the programme, we, the resource personnel, are satisfied that learning has been made and the objectives of the training have been met.

Why do you grow coconuts?

Table 3a. Men's group

Uses	Score (1-10)	Rank
For food	10	1
Custom spoon	10	1
Drinking	5	4
For oil	7	2
Firewood	10	1
Copra	6	3
Custom fan	6	3
Income (green nut)	10	1
Toddy	1	6
Timber	1	6
Broom	10	1
For net	1	6
Mat	2	5
Basket	10	1
Animal feed	10	1

Table 3b. Women's group

Uses	Score (1-10)	Rank
Cream for cooking	10	1
Cooking oil	5	5
Body/hair oil	8	3
Income (green nut)	10	1
Baskets	9	2
Copra	8	3
Mats	6	4
Custom spoon	2	6
Timber/post	1	7
Broom	10	1

Both men and women give highest ranking for
1. food
2. green nuts for income
3. brooms

Coconut parts and their uses

Table 4a. Men's group

Parts	Uses	Score (1-10)	Rank
Roots	–	–	–
Bark	Tea	1	6
	Fire	10	1
Skin	For post	1	6
	For fire	10	1
	Crossing bridge	1	6
Leaves	Light (torch)	10	1
	Garden house	5	3
	Broom	10	1
	Basket	5	3
	Mat	3	4
Nuts	For food	10	1
	Copra	6	2
	Oil	5	3
	Income	10	1
	Animal feed	10	1
	Spoon	2	5
	Cups	1	6
	For drinking	6	2

* Note: score of 10 refers to "everyday use"

Table 4b. Women's group

Parts	Uses	Score (1-10)	Rank
Roots	Medicine	2	7
	Rope for tying	3	6
Bark	Fresh bark for tea	2	7
	Firewood	10	1
	Rope for tying	2	7
Stem	Core used as food/feed	5	5
	Firewood	10	1
	Post/timber/fence	8	3
	Furniture	7	4
Leaves	Baskets	10	1
	Hats	5	5
	Mats	5	5
	Decoration	8	3
	Custom fan	10	1
	Small huts in garden	10	1
	Cooking wrap	9	2
	Sports balls	8	3
	Torch	10	1
	Broom	10	1

Table 4b. Women's group (Continued)

Parts	Uses	Score (1-10)	Rank
Nuts	Husk for firewood	10	1
	Husk for rope	2	7
	Husk for table broom	5	5
	Strainer	8	3
	Eating utensils	10	2
	Cooking oil	10	1
	Food	10	1
	Drink	10	1
	Body/hair oil	8	3
Tetevu (net-like covering of petiole)	Ceremonial costumes	10	1
	Custom strainers	10	1

Characteristics of different varieties and their uses

Table 5a. Men's group

Varieties→	Teiti♦	Niu Mara	Niu Magata*	Niu Semua*	Niu Mega	Niu Bulo*	Niu Sisi*	Niu Betona	Niu Poposa♣
Characteristics↓									
Big nuts	2	9	5	8	7	6	9	10	8
More nuts	8	8	10	6	9	7	10	10	10
Big leaves	5	8	10	9	9	8	9	10	10
Long fruiting life	4	5	10	6	8	7	10	5	10
Easy husking	3	6	5	10	4	10	10	10	10
Good for copra	–	10	10	10	10	10	10	–	10
Good for firewood	1	3	2	2	1	3	4	1	2
Early bearing	10	9	9	7	7	8	7	10	8
More milk	–	3	9	4	5	6	9	2	10
More oil	–	3	10	7	3	4	10	–	9
Sweet for drinking	10	8	9	10	2	7	10	2	9
Resistant to cyclone	1	2	4	3	3	2	10	5	10
Pest resistant	5	5	5	10	10	8	5	5	10
Good for basket	10	10	5	2	4	10	10	–	8
Good for mats	7	10	10	5	3	4	8	–	7
Good for spoons	8	2	2	2	10	2	2	2	2
Good for tea	–	–	–	10	–	–	–	–	–
Total	74	101	124	121	95	102	133	72	133

Note: *Identified by MAFF as cultivars of Solomon Tall
♦Identified by MAFF as Malaya Red Dwarf
♣Possible local name for Solomon Tall

Table 5b. Women's group

Varieties→	Niu Kou♣	Niu Mara	Niu Magata*	Niu Sisi*	Niu Thaveni-mega	Niu Kubola	Niu Bolu*	Ethieti◆	Niu Semua*
Characteristics↓	Tall, G/R	Tall, Y	Tall, G	Tall, G/R	Tall, G/R	Short, G/R	Short G	Short, R	Short, R
Many nuts	9	5	10	10	5	10	10	9	10
Big nuts	9	5	10	8	10	10	7	3	3
Early bearing	7	10	10	10	4	10	10	10	10
Good drinking taste	10	5	10	6	5	4	10	5	10
Good for copra	10	1	10	10	10	5	10	–	–
Good for weaving (leaf long and soft)	10	5	8	10	–	5	8	10	10
Resistant to strong winds	10	5	10	10	10	3	8	10	10
Good milk content	10	2	10	10	5	5	10	–	–
Good oil content	10	–	10	10	5	5	10	–	–
Long bearing life	10	8	10	10	8	5	10	8	8
Disease resistant	9	5	9	9	7	4	9	10	10
Pest resistant	10	3	10	10	5	5	10	10	5
Low care	10	2	10	10	10	5	10	10	5
Good timber	10	10	10	10	10	4	10	10	5
Good for firewood	10	10	10	10	10	10	10	10	10
Good for eating utensils	10	10	10	10	10	10	10	10	–
Good string quality	10	10	10	10	10	10	10	10	–
Good meat taste	10	5	10	10	8	5	10	5	10
Marketable nut size	10	20	20	20	20	20	10	8	10
Total	184	121	187	183	127	125	182	138	116

Note: G= green fruit
R= red fruit
Y= yellow fruit

*: Identified by MAFF as cultivars of Solomon Tall
◆: Identified by MAFF as Malay Red Dwarf
♣: Identified by MAFF and villagers as Solomon Tall

Constraints in coconut production (Pairwise ranking)

Table 6a. Men's group

Problem	Climate	Pests	Labor	Low income	Weeds & Pests	Land disputes	Lack of know-how	Score	Rank
Climate	X	Pests	Climate	Climate	Weeds & pests	Land disputes	Lack of know-how	2	4
Pests		x	Pests	Pests	Weeds & pests	Land disputes	Lack of know-how	3	3
Labour			x	Labor	Labor	Land disputes	Lack of know-how	2	4
Low income				X	Weeds & pests	Land disputes	Lack of know-how	–	–
Weeds & pests					x	Land disputes	Lack of know-how	3	3
Land disputes						x	Land disputes	6	1
Lack of know-how							x	5	2

Table 6b. Women's group

Problems	Climate	Pests	Bad Weather	Market price	Score	Rank
Climate	X	pests	Bad weather	Market price	–	–
Pests		x	Bad weather	Pests	2	2
Bad weather			X	Bad weather	3	1
Market price				X	1	3

Highest ranked problems:

Men
1. Land disputes
2. Lack of know-how
3. Weeds/pests

Women
1. Bad weather
2. Pests
3. Market price

Women's focus group. Kormubiti Village, Dodo Creek, Solomon. Dec. 1, 1988.

Workshop participants. Solomon Islands. Dec. 10, 1988.

Farmer participatory research phases and protocols for participating countries

Based on the training workshops in four countries and initial village level testing of protocols for farmer participatory research, protocols were formulated for the IFAD-funded project. These protocols have been adopted by the project coconut researchers in 14 countries of the Asia Pacific region. Other researchers are encouraged to use these protocols so that they could be further refined base on actual experience.

Farmer participatory assessment of coconut diversity and its uses

Year 1

- Participatory survey
- Diagnostic and documentation - list types and uses

Year 2

- Detailed characterization of most valuable types
- Identify coconut types for new uses - add value
- Identify traditional coconut cultivars under threat

Year 3

- Strategies to add value to local varieties
- Strategies to maintain diversity within coconut based farming systems
- Link to formal coconut PGR conservation, R&D and income generating projects

Farmer participatory research

Year 1. Diagnostic of survey

Protocol: Farmer participatory research

Steps	Time
1. Preparation and team building	1 - 3 weeks
2. Community participatory diagnostic	3 weeks
3. Participatory research on farmer- managed coconut diversity	3 months
4. Information and data analysis	2 months
5. Return results to community	1 month
6. Link on-farm diversity to:	
a. coconut research, conservation and development	
b. wide dissemination and identification of developing options	

Problem solving using Participatory Rural Appraisal (PRA)

The following were identified as important background factors for the study of coconut diversity in Fiji:

1. the surface area planted under coconut is the second largest to that of the dominant crop, sugar cane;
2. there has been a short term increase in copra prices;

3. other countries in the region share similar farming situations and environment; and
4. there are structural factors/fundamental constraints to development, including:
   - isolation of large and small islands
   - estate versus small farm production
   - ethnic differences
   - changes in rural and urban population
   - urban bias in development spending

Historical development of participatory approaches in Fiji

Farm systems research was conducted in Fiji in 1954 and 1957. However, Participatory Rural Appraisal has only recently been institutionalized by NGOs, planning agencies, infrastructural services, development banks and regional organizations.

Over the years, there have been changes in household composition as well as in the labour division and agricultural decision making. There are several questions regarding the institutionalizing of PRA:

- Is the method too complicated or costly to apply?
- Are PRA techniques project based, or are they donor driven?
- Does PRA reach policy level?
- Can change in development culture from top down to bottom?

Applying Participatory Rural Appraisal (PRA)

Farm households

Farm household is the key focus. Resources which are available to and managed by household, are reflected in the following areas:

- landscape
- knowledge
- linkages to external resources - inputs, outputs
- linkages to other system
- social obligations and culture

Holistic approach and ethical concerns

- target the people not just the commodity
- do not assume and do not take things for granted
- respect local beliefs and traditions
- return information to all the groups in a community
- do not judge the roles and duties of the community

Gender analysis

Gender analysis is an essential part of all PRA

- social roles are determined by cultural and these vary across villages and cultural communities
- PRA and survey questionnaires should be gender sensitive

Review of methods

Historical profile

Documents the changes and trends in resource use.

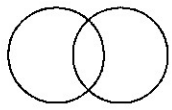
Resource mapping
Locates significant spaces - those which are sacred, of historical significance etc.
- Illustrates how people perceive their community and landscape
- Creates focal point for demonstrating different perceptions of different members of the community

Seasonal calendar
Illustrates the distribution of activities throughout the year.
- Use the local time frame - seasonal
- Crop cycles can be displayed - overlaid - seasonality

Activity profile
Asks the questions who does what?
- Gender, age division of labour, who decides?
- Who manages?

Matrix scoring
Target group to determine criteria to rank and score in order for their knowledge to be represented.

Venn diagram
Maps locally important institutions and their interrelationships.



- Degrees of interaction of participation
- By proximity to the focal point
- Gives the community perspective of where an organization lie
- Depends on the different sector of the community

Network diagram
Show links and interaction between activity spheres and institutions.

Impact flow diagram
Demonstrates the impact of adverse situation e.g. flood, drought.

Transect walk
Maps the diversity and distribution of the resources in their landscape, including problem areas.

Group discussion
Allows the voicing of different perceptions and interpretation within a community.
- Brainstorming and prioritizing
- Identifying courses' solutions

Case studies

Phases of IFAD project

Year 1
- Farmer participatory survey
- Diagnostic & documentation - list types and uses of data

Year 2
- Detail characterization of most valuable types
- Identify coconut types for new uses add value
- Identify traditional coconut cultivars under threat

Year 3
- Strategies to add value to local varieties
- Strategies to maintain diversity within coconut-based farming system
- Link to coconut PGR conservation, R&D and income generating projects

Time frame of diagnostic and survey

Steps	Time
1. Preparation and team building	1-3 weeks
2. Community Participatory Diagnostic	
Identify sites – strict minimum of 3 sites	3 weeks
3. Participatory research on farmer managed coconut diversity	
(deadline Sept.98) IFAD Nov. 98.	6 months
4. Data analysis and information reporting & analysis	4 months
5. Return results to community	
6. Link on farm diversity :	
• to coconut research, conservation and development	
• wide dissemination & identification of development options	

Project protocol

1. a) Pre-visit preparations
   b) ID of team members

2. Teams should be:
   a) multidisciplinary
   - Socioeconomic specialist
   - Genetic resource specialist
   - Development specialist

   b) gender balanced
   c) made up of individuals with varied experience
   d) guided by common understanding and objectives - study focus

3. Select survey / study specific sites
   - ecogeographic differance
   - which degree do they depend on coconut
   - socioeconomic coconut diversity
   - cultural (ethnic-Fijian & Indian)
   - sufficient size sample

Criteria

1. Project objectives
   - Diversity
   - Developments
   - Farmer management

2. National Coconut Development Trust
   - Income
   - Renewal
   - Diversification

3. Community history - involvement in R&D.

Background

1. Team building and site selection
   - Absolute minimum - three to five targets
   - Team meeting - TOR for survey, team members
   - Technical support for use of participatory approach

2. Diagnostic survey
   a) Courtesy visit - official channels
   - Notify or explain objectives to community
   - Cost
   - Time

   b) Community dialogue, diagnostic - PRA i.e. interviewing of villagers PRA one-day return visit
   c) Participatory farmer research coconut diversity - 3 days/3 wks/sites
   - Socioeconomic survey tenure/household composition·income sources
   - Seed systems - plating materials
   - Intercropping transect, calendar, use of inputs / agronomic practices
   - Coconut-based farming system (CBFS)

Outputs

List coconut cultivars and their uses.

- Describe diagnostic tools used
- Distribution across farming system per type
- Ranking
- Potential constraints
- Choices and decision making factors per type
- Population data on coconut types, sampling
- Quantitative measures of characters
- Relationships between types based on characters dendograms data base and types (dendogram means the relationship)
- Description of local management of coconut diversity in small holder farming systems

Return results to the community

Method	How/Where	Output
A record in simple and direct local language (3-4 pages)	For each site As public record	Increase pride in local knowledge
Visual documentation , graphs, photos, maps and posters	Distribution to be agreed with community	Add value to local resources
Time, place, participants		Basis to protect community intellectual property
Record of local general resources		

Link (Method)

- Database on local cultivars to be available to national/regional programme.
- On farm based conservation and use approaches - shared with national/regional programmes.

How/Where

- Germplasm enhancement
- Seed multiplication
- On farm management
- Ecotourism
- Marketing
- Processing
- Production

Dissemination

Method	How/Where	Output
Scientific papers	General Division Studies	Journal
	Farmer decision making studies	Technical
	On farm management of division	Newsletter
Extension development materials	How to promote use of coconut type Policy makers	
Educational materials	Coconut as friend of the small farmers.	Bulletins
Public awareness	Food security	Posters
	Green marketing	Recipes
		Regional publications

Appendix I. Workshop programmes

Philippines workshop programme

Participants

Coconut breeders, germplasm curators and social scientists from Bangladesh, India, Sri Lanka, Indonesia, Malaysia, Philippines, Thailand and Vietnam, farmer representatives and extension workers from the Philippines and scientists from IPGRI.

Workshop objectives

1. Review and apply state of the art methods on participatory research with farmers to the case of coconut genetic resources.
2. Identify key areas where participatory research methods enable both farmers and coconut researchers to locate and maintain useful characters, and diversity in coconut.
3. Develop strategies to add value to diverse coconut genetic resources by improving the uses and sources of germplasm.
4. Develop protocols for participatory and multi-disciplinary coconut research and conservation activities in participating coconut-producing countries.

Workshop outputs

1. A menu of methods which participants can use jointly with farmers in their countries to assess coconut diversity and its uses.
2. A template to compare farmer-perceived and managed coconut diversity with the coconut genetic resources available from formal coconut research and germplasm programmes, resulting in a more complete and holistic identification of useful coconut diversity.
3. Coconut germplasm strategies that link research station and genebank genetic resources with coconut ecotypes in local farming systems to provide greater range of coconut diversity, and coconut products.
4. A set of tool kits for use by national programmes in the field to link farmers and researchers, to assess coconut germplasm available from research and genebanks with that maintained by farmers.

Programme

Day 1 - 16 March 1998

8:30 Welcoming address: Mr Carlos B. Carpio, Philippine Coconut Authority, Diliman; Mr Romero C. Blancaver, Manager, Davao Research Center, Philippine Coconut Authority; Mr Edgar T. Bahala, Manager, Coconut Extension Training Center, Philippine Coconut Authority

9:00 Introduction to the IPGRI-IFAD Project: Sustainable uses of coconut genetic resources to enhance incomes and nutrition of smallholders in the Asia-Pacific region: Dr Pons A. Batugal, COGENT Coordinator, IPGRI

9:30 Discussion on workshop structure and agenda and training objectives: Dr Pablo Eyzaguirre, Senior Scientist, IPGRI

10:00 Farmers' contribution to improving the value and uses of coconut diversity. Dr Pablo. B. Eyzaguirre

10:45 Tea Break

11:00 Use of participatory approaches to agricultural research and development: the CIP-UPWARD experience: Ms Cherry Bagalanon

11:45 Discussion

12:00 Participatory evaluation of coconut genetic resources: Mr Edwin Balbarino

13:00 Lunch

14:00 A roundtable discussion: country participants

Diversifying the sources and future demand for coconut genetic resources in Asia: country participants

- How can coconut farmers contribute?
- How can coconut genetic resources improve their livelihoods?

15:00 Tea break

15:15 Holistic approach to characterizing coconut diversity and value: Dr Pablo B. Eyzaguirre and Ms Elinor Lipman

16:00 Discussion: multiple uses, coconut based farming systems and genetic diversity.

- Size of holding
- Coconut and the environment
- Commercial and non-commercial uses
- Knowledge systems, cultural practices, cultural change
- Time allocations and input use
- Household decision-making
- Tenure and access to resources

16:30 Tools for participatory research on crop and tree diversity: Amanda B. King, Ethnobotany Intern, IPGRI

- Participatory Rural Appraisal
- Focus group interviews
- Use of questionnaires, when and how
- Gender analysis
- Developing sampling procedures

17:00 Closing

Day 2 - 17 March 1998

8:30 Introduction to Participatory Rural Appraisal and Diagnosis

- Participant observation
- Transect walks
- Elicitation of farmer knowledge
- Farmer perceptions of traits
- Recording knowledge and fostering local transmission systems
- Farmer participatory characterization of coconut diversity: some guidelines

10:00 Break

10:30 Discussion: putting together a kit of participatory tools for field practicals

Working groups:
- Coconut diversity in the ecosystems
- Coconut diversity in the households
- Coconut diversity for diversified uses and markets

12:30 Lunch

13:30 Working groups to developing guide questions and procedures for PRA

14:30 Reports and discussion on the components of farmer participatory research on coconut diversity: Facilitators: Cherry Bagalanon, Ed Balbarino and Pablo Eyzaguirre

15:00 Tea Break

15:15 Resume: Putting together the components

16:00 Formation of multi-disciplinary teams for field practicum

17:00 Closing

Day 3 - 18 March 1998

7:30 Field visits: Presentation of objectives to the community; lunch with community; focus groups; test of participatory diagnostic and research tools

Field visit to three barangays
1. Riverside, Calinan, Davao
2. Dacudao, Calinan, Davao
3. Wangan, Calinan, Davao

Day 4 - 19 March 1998

8:30 Working groups to prepare reports on field practicals
- Ecological situation
- Socio-cultural situation
- Interaction
- Methods

12:30 Lunch

13:30 Working group presentations on the field procedures for participatory assessment of coconut diversity and its uses

15:30 Tea

15:45 Discussion of the participatory methods and how they will be used to identify and maintain and expand the use of coconut diversity

17:00 Closing

Day 5 - 20 March 1998

8:30 Working group in plenary to prepare the field protocols for implementation in the IPGRI-COGENT Project

10:30 Tea break

10:45 Continue with working groups

12:30 Lunch

13:30 Discussion on site selection, sample size, and analysis

14:30 Building a multidisciplinary team for participatory characterization of coconut diversity: suggestions for participating countries

15:00 Tea

15:30 Presentation of agreed field protocols and participatory tools

16:00 Logistical considerations for country studies

16:30 Planning for dissemination and transfer of results

17:00 Closing ceremony and presentation of certificates to
1. Mr Romero Blancaver
2. Mr Carlos Carpio
3. Dr Pablo Eyzaguirre

Fiji workshop programme

Programme

Day 1 – 24 March 1998

8:30 Welcoming address

9:00 Introduction to the IPGRI-IFAD Project: Sustainable uses of coconut genetic resources: Dr Pons Batugal, IPGRI-COGENT

9:30 Discussion on workshop structure and agenda and training objectives: workshop facilitators

10:00 What farmers can teach us about coconut diversity and its uses: Dr P. Eyzaguirre

10:45 Tea break

11:00 Use of participatory approaches to agricultural research and development; examples from South East Asia: Dr Juliet Roa

11:45 Discussion

12:00 A roundtable discussion: diversifying the sources and future demand for coconut genetic resources in the participating countries. Country participants and facilitators: P. Eyzaguirre
- How can coconut farmers contribute?
- How can coconut genetic resources improve their livelihoods?

13:00 Lunch

14:00 Who are the coconut producers? Coconut in the household economies: introduction and outline for characterizing producers and users.
- Size of holding
- Coconut and the environment: where is it grown and in what associations
- Commercial and non-commercial uses
- Coconut and cultures: knowledge systems, cultural practices, cultural change and uses of coconut
- Time allocations and input use
- Household decision-making
- Tenure and access to resources

15:00 Tea break

15:15 Summary discussion of areas for participation by farmers in coconut genetic resources conservation and use: country presenters

16:00 Introduction to Participatory Tools (part 1)
- Gender analysis
- Participant observation
- Participatory Rural Appraisal

17:00 Closing

Day 2. – 25 March 1998

08:30 Introduction to Participatory Tools (part 2)
- Interviews
- Use of questionnaires- when and how
- Farmer participatory characterization of coconut diversity: some guidelines

10:00 Break

10:30 Discussion: putting together a kit of participatory tools for the field working groups:
- Coconut diversity in the ecosystems
- Coconut diversity in the households
- Coconut diversity for diversified uses and markets

12:30 Lunch

13:30 Working group reports

14:30 Discussion: Putting together the components of farmer participatory research on coconut diversity: Juliet Roa, Pablo Eyzaguirre (facilitators)

15:00 Tea Break

15:15 Resume discussion: Putting together the components

16: 00 Formation of multi-disciplinary teams for field practicum

17:00 Closing

Day 3 – 26 March 1998

7:30 Field visit
Presentation of objectives to the community
Lunch with community
Focus groups
Test of participatory research methods

Day 4 – 27 March 1998

8:30 Working groups to prepare reports on field practicum
- The ecological situation
- The socio-cultural situation
- The interaction
- The methods

12:30 Lunch

13:30 Working group presentations on the field protocols for participatory characterization of coconut diversity and its uses

14:30 Discussion of the participatory methods and what they can tell us about coconut diversity and its uses

15:30 Tea

15:45 Key elements to adapt the field protocols and participatory tools to fit the coconut based farming systems in the respective countries: presentations of case study by country

17: 00 Closing

Day 5 – 28 March 1998

8:30 Building a multidisciplinary team for participatory characterization of coconut diversity: Suggestions for participating countries

9:30 Working groups to revise/adapt the field protocols for implementation in the IPGRI-COGENT Project

10:30 Tea break

10:45 Continue working groups

11:30 Presentation of revised protocols and participatory tools for the participating countries

12:30 Lunch

13:30 Discussion on site selection, sample size, and analysis

14:30 Tea

14:45 Logistical considerations for country studies

16:00 Planning for dissemination and transfer of results

16:30 Closing remarks: workshop organizers and hosts

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IPGRI

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IFAD
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AGRICULTURAL
DEVELOPMENT

IPGRI is an institute of the Consultative Group on International Agricultural Research (CGIAR)

ISBN 92-9043-9

Published by the Regional Office for Asia, the Pacific and Oceania (APO)