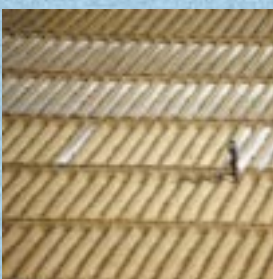


guide

Irrigation Sector Guide

SEAGA

Socio-Economic and Gender Analysis Programme



Food and Agriculture Organization
of the United Nations

SEAGA

SECTOR GUIDE:

IRRIGATION



Extension poster for the discussion on women's involvement in the Cidurian Project, Indonesia
Spot the differences between the two pictures!

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INTRODUCTION

This document is a guide to the integration of socio-economic and gender issues in the sub-sector irrigation. The Guide has been developed in the context of the FAO Socio-economic and Gender Analysis (SEAGA) Programme. SEAGA is an approach to development based on an analysis of socio-economic patterns and participatory identification of women and men's priorities. The objective of this approach is to close the gaps between what people need and what development delivers. By placing socio-economic analysis and gender analysis together, SEAGA helps us learn about community dynamics, including the linkages among social, economic and environmental patterns.

PURPOSE OF THE GUIDE

The purpose of the SEAGA Sector Guide on Irrigation is to support gender-responsive participatory planning of irrigation schemes, and to integrate socio-economic and gender issues in the planning process. The ultimate aim is to improve irrigation scheme performance while strengthening the position of rural women and disadvantaged groups.

SEAGA Definitions

Socio-economic Analysis:

The study of economic, social, institutional, political, environmental and demographic patterns and their linkages, which together compose the context for development.

Gender Analysis:

The study of the different roles of women and men to understand what they do, what resources they have and what their needs and priorities are.

Participation:

A process of communication, problem identification and decision-making among local people and development agents during which local people take the leading role to analyse the current situation, and to plan, implement and evaluate development activities.

This Guide is written for the people who are involved in the planning, design and implementation of irrigation programmes. It is therefore intended for irrigation engineers, members of multidisciplinary identification and formulation missions, staff of rural development projects, government employees, staff of NGOs, and engineering and consulting firms.

Some basic definitions

Irrigation systems are the mechanisms that allow water to be diverted from its original location and delivered to agricultural fields for the purpose of supplementing water available for growing crops and enhancing crop yields. Irrigation is useful to many agricultural producers when the natural rainfall is below normal levels or is irregular.

Water Management.

Increasingly, irrigation refers to the different uses of water and the term Water Management is used. Water Management focuses on the use of water for agriculture, including irrigation, but it also deals with drainage, flood control, water harvesting, watershed management, etc.

Farmers Water Management (FWM) is the process by which individual farmers and farmers' institutions set objectives for the management of their water resources, establish appropriate conditions, and identify, mobilise and use resources so as to attain these objectives (FAO, 2001).

LESSONS LEARNT

The volume of literature concerning the lessons learnt from irrigation schemes is large. A number of studies have been conducted on the differential impacts of irrigation on various social groups such as large landowners, subsistence farmers, sharecroppers or landless labourers. These studies indicate that irrigation in general has greatly increased agricultural production, but has benefited large farmers more than marginal ones.

Environmental impacts of irrigation have been many and varied. These include health impacts (increase of malaria and schistosomiasis), water logging and induced salinity. Land acquisition and resettlement have also had some negative social impacts, such as the marginalization of certain groups, and a decrease in the nutritional well being of families.

Some of these reports specifically describe the impact of irrigation development on women as compared to men. Irrigation projects provide some of the most striking examples of project failures caused by a mistaken understanding of the intra-household organization of production.

Women and men appear to have different incentives for investing time, labour, and capital in irrigation-related activities. This reflects the gender differences in responsibilities, access to and control over productive resources, (including water), and in the benefits gained from irrigated agriculture (Zwarteveen, 1994). However, irrigation development will play an increasingly important role in the future.

This Guide summarises some of the lessons learnt, both positive and negative, which have been translated into guidelines for future irrigation development activities. The Guide provides some practical tools to allow development agents to integrate socio-economic and gender issues into irrigation planning. It is, therefore, a document that complements existing guidelines and manuals on irrigation development.

Practical translation of these guidelines into specific activities will largely depend on the interests and needs of the beneficiaries, women and men farmers, based on their constraints and opportunities. On the other hand, it will also depend upon the willingness, motivation and creativity of the user. Because each irrigation programme, field situation, region and country differs, not all issues will be relevant for each particular situation. There may also be other important considerations not mentioned here.

THE SEAGA APPROACH AND PRINCIPLES

Socio-economic and Gender Analysis is an approach to development based on an analysis of socio-economic factors, and participatory identification of the priorities and potentials of both women and men.

The objective of the SEAGA approach is to close the gaps between what people need and what development delivers. For this purpose three different levels are distinguished:

- Field (household and community) level.
- Intermediate (structures, institutions, river basin) level.
- Macro (legal, national and international policy) level.

The SEAGA approach has three guiding principles:

- **Gender roles and relations are of key importance**
- **Disadvantaged people are a priority in development initiatives**
- **Participation is essential for sustainable development**





Therefore, the SEAGA approach, with its focus on understanding both socio-economic and gender differences in the development process at field, intermediate and macro levels, is especially appropriate for the irrigation sub-sector.

The SEAGA Package

The Sector Guide on Irrigation, which addresses application of SEAGA to the irrigation sector, is just one piece of the complete SEAGA Package. Three Handbooks are available that describe specific tools. *The Field-level Handbook* is written for development agents who work directly with local communities. *The Intermediate-level Handbook* is for those who work in institutions and organizations that link macro-level policies to the field level, including government ministries, trade associations, educational and research institutions. *The Macro-level Handbook* is for planners and policy makers, at both national and international levels. There are also other sector guides that deal specifically with issues such as the project cycle, animal genetic resources etc.

GUIDE STRUCTURE

The Sector Guide consists of three parts:

- **Part I** applies SEAGA to the different stages in the project cycle.
- **Part II** consists of ten tools that can be used for participatory and gender sensitive irrigation planning. References to these tools are indicated in the text as follows:  and the number of the tool. For more in-depth socio-economic and gender analysis, the guide indicates links to specific tools described in the three SEAGA Handbooks, which are indicated as follows: + FH = link to Field-level Handbook, + IH = link to Intermediate-level Handbook, and + MH = link to Macro-level Handbook.
- **Part III** presents a training guide, including some exercises and case studies.

Part I of the guide follows the four stages of the project cycle:

- **Identification and preparation**
- **Design**
- **Implementation**
- **Monitoring and Evaluation (M&E)**

Socio-economic and gender implications are linked to each activity and some examples of case studies are provided. Each paragraph concludes with a list of key questions to answer during each stage of project development.

In **Part II**, the “Tool Box”, ten participatory and visual tools are presented that can be used in the planning and design process. The tools are adapted to an irrigation context, and each includes a short description of the purpose of the tool, the procedure for its use, and a practical example. Each tool concludes with a list of key questions to answer while facilitating the Participatory Rural Appraisal (PRA) sessions.

In **Part III**, the Training Guide, four training exercises and five case studies are presented that can be used in a training programme on socio-economic and gender issues for irrigation professionals.

The Guide should be used side by side with other manuals and guidelines on the technical, environmental, economic, and institutional aspects of irrigation planning. Some suggestions for manuals, guidelines, bibliographies and Internet sites are provided in **Annex I.1** of this Guide.

It is especially recommended that the guide be used in conjunction with the Guidelines and Farmers’ Training Manual for Participatory Training and Extension in Farmers’ Water Management (PT&E – FWM) produced by the Water Service of the Land and Water Development Division (AGLW) of FAO. For more information on the PT&E – FWM manuals, contact AGLW by sending an email to: farmer-water-training@fao.org or look at the following website: www.fao.org/ag/agl/aglw/farmerwatertraining

Participatory Training and Extension (PT&E) is a tool to reach the goal of improved Farmers’ Water Management by:

- involving and supporting farmers with a focus on participatory planning; and
- training farmers and extension workers.

Specific references are included to tools and modules of the PT&E – FWM to facilitate the use of the material in conjunction with this SEAGA Sector Guide.

PART I: THE PROJECT CYCLE

INTRODUCTION

Part I applies SEAGA to the four stages in the project cycle. The Guide follows the four stages of the project cycle:

- Identification and preparation
- Design
- Implementation
- Monitoring and Evaluation (M&E)

As each irrigation project, field situation, region and country differs, not all issues mentioned here would be relevant for each particular situation. Likewise, there may be some issues of relevance in specific situations that are missing here.

Working in Multi-disciplinary Teams

During the four stages, teams of experts often do the planning and advisory work. These are normally specialists from different disciplines, hence the term multidisciplinary teams.

In the context of irrigation projects, such teams can consist of an irrigation engineer, agronomist, economist, sociologist, credit specialist, etc. Teams can include experts who are government officials, project staff, consultants, NGO workers, etc. They can also be composed of a mixture of national and international experts.

Since socio-economic and gender issues are crosscutting, all team members would need to focus on these issues in their specific fields of expertise or discipline. For this reason, it is important that each team member's Terms of Reference (ToRs) includes specific reference to these issues.

For example, the ToRs of an irrigation engineer would refer to collecting data on the roles and responsibilities of women and men of different socio-economic groups in water management, irrigation scheme construction and maintenance, and the assessment of socio-economic and gender issues related to proposed irrigation activities.

Likewise, the ToRs for an agronomist would need to include references to: collecting data on the gender division of labour in irrigated agricultural production for each socio-economic group, identifying the problems and needs of both women and men in crop production, and assessing socio-economic and gender issues related to proposed agricultural activities.

Involvement of Socio-economic and Gender Expertise

Even if all team members and staff have responsibility for socio-economic and gender issues in their respective disciplines, it is often advisable to have one person appointed to advise specifically on socio-economic and gender issues and to co-ordinate the activities in this field.

Therefore, during preparation and design, implementation and M&E, socio-economic and gender expertise needs to be part of the teams of staff and/or consultants capabilities. This expertise could be included in the person of one socio-economic and gender expert, who would work solely on these issues. It could also be an expert in another discipline who has socio-economic and gender expertise, e.g. a sociologist, PRA expert, agronomist, or irrigation engineer. This expert, in addition to focusing on his or her own discipline, would ensure that socio-economic and gender issues are integrated throughout the four stages of the project, and advise other team members.

Some examples of ToRs for socio-economic and gender experts in the different phases of the project cycle are provided In Annex I.2 of this Guide. These examples would need to be adapted to each specific situation.

The following Table illustrates the structure of **Part I** of this Guide, including the four stages of the project cycle and the specific activities in each stage.

Table 1 *Irrigation project development stages and activities*

Project stage	Main activities (Paragraph number)
1. Identification/Preparation	<ul style="list-style-type: none"> • Development Context Analysis (1.1) • Livelihood Analysis (1.2) • Stakeholder Analysis and Participation (1.3) • Collection and Review of Data (1.4) • Mapping (1.5) • Selection of Technology (1.6) • Available Water Resources (1.7) • Irrigation Water Requirements (1.8) • Institutional Capacity (1.9) • Options Assessment (1.10) • Comparison of Likely Costs and Benefits (1.11) • Achieving Consensus (1.12)
Output	Project goal and purpose defined
2. Design	<ul style="list-style-type: none"> • Detailed Studies (2.1) • Design Choices (2.2) • Water Management (2.3) • Credit/Saving (2.4) • Monitoring Indicators (2.5) • Project Costs (2.6)
Output	Project outputs and specific activities (inputs) defined
3. Implementation	<ul style="list-style-type: none"> • Construction (3.1) • Operation and Maintenance (3.2) • Training and Extension (3.3)
Output	Achievement of the project purpose
4. Monitoring and Evaluation	<ul style="list-style-type: none"> • Monitoring (4.1) • Evaluation (4.2)

1 PROJECT IDENTIFICATION AND PREPARATION

1.1 Development Context Analysis

Development context analysis is the study of environmental, economic, political, institutional, demographic and social patterns and their linkages, which together compose the context for development. Analysis of constraints and identification of opportunities for irrigation interventions must include information on the context for development as a whole. A number of general patterns in the context of irrigation development at the **macro**, **intermediate** and **field** level are described below.

At the **macro** level the decline in world market prices for staple crops and typically high capital costs per hectare have resulted in new irrigation development becoming increasingly difficult to justify economically. In many countries improved irrigation sites are already developed, and new projects could be expected to cost even more per hectare than those developed in the past. As existing irrigation systems tend to perform below potential, the emphasis in recent years has shifted from new irrigation development to the **upgrading and improvement** of under-performing irrigation schemes.

At present, nearly 40 percent of the world's food comes from the irrigated 17 percent of the total cultivated land. It can be expected that the world's food supply will depend to an even larger extent on irrigation in the future, and that on a global scale, water will become a scarce resource over the next century. This transition from an era of 'plenty' to a situation of scarcity requires a review of existing policies for water development and allocation among users.

Furthermore, in many developing countries the number of female-headed households is increasing significantly in rural areas, as men migrate due to lack of employment and other income-generating activities. This leads to a **feminisation of agriculture**.

At the **intermediate** level, the objectives of structural adjustment policies, economic efficiency and fiscal sustainability have initiated in many countries a **privatisation** process. These privatisation policies have had a significant impact on the irrigation sector in developing countries. These policies often result in:

- transfer of the operation to Water Users' Associations of various kinds, including maintenance responsibilities and the entire or partial costs of the irrigation systems;
- pricing of water based on quantity and quality used; and
- creation of water markets for the buying and selling of water both among individual users and the agricultural, urban and industrial sectors (cf. Seckler, 1993).

Consequently, the role of the government and the involved ministries changes from operation and maintenance of schemes to overall planning, monitoring and evaluation. Projects are also increasingly planned to match local capacity for implementation, which implies specific attention to an analysis of **institutional capacity**.

At the **field** level, intensification of traditional, **low-cost irrigation** developed on the initiative of farmers, receives increased support due to its potential for increasing food production. Successful implementation requires **participation** in planning and implementation by all stakeholders in order to create a sense of ownership and consequent commitment to the project. Participation also helps to ensure that the design is appropriate, which will attract commitment because it adequately addresses the varied needs of the participants. As part of the privatisation policies, Water Users' Associations, (**WUAs**), are created, and all or part of the operation and maintenance responsibilities are transferred to these organizations¹.

Key Questions for Analysis and Summary

- What are the environmental supports for irrigation development? What are the environmental constraints?
- What are the economic supports for irrigation development? What are the economic constraints?
- What are the social supports for irrigation development? What are the social constraints?
- What are the institutional supports for irrigation development? What are the institutional constraints?
- Is the overall development context favourable for irrigation development? If not, what should change?

1.2 Livelihood Analysis

For an irrigation project to have a positive and sustainable impact, stakeholders must be committed to the project because their priorities converge with those of the proposed irrigation scheme. Participatory Livelihood Analysis can assist in assessing women and men farmers' perceptions and their likely response to the opportunities of the project, as well as to the demands that the project may make on them, such as operation and maintenance of the scheme.

People engage in irrigation to secure their basic needs and to earn income; but their activities depend greatly on their access to land, labour, water, markets, knowledge and capital, which are the main resources in the context of irrigated agriculture. Within any given culture, access to resources varies according to gender, age, wealth, caste and ethnicity, and therefore, so does livelihood.

When planning to implement an irrigation project we should assess the resources available to each stakeholder group, and the constraints that they face. Planners must be aware of resources and constraints at all three levels (macro, intermediate and field) in order to determine which changes are needed at each level.

At the **macro** level, international and national policies determine resource availability and distribution, such as Water Resource Policies, international funding and loan agreements, legal arrangements, etc.
(→MH Developing Gender Sensitive Sector Policies).

¹

Adapted from the Investment Centre Division (TCI), 1996

At the **intermediate** level, resources and constraints may include the number of field staff, transport facilities, annual budgets, etc. (☞ IH Organizational Capacity and Resources).

At the **field** level, an analysis of the farming system highlights the on-farm activities such as crop production, off-farm activities such as drinking water collection, and non-farm activities such as marketing. It shows the flow of resources to and from the household, and which household members are involved, disaggregated by sex (☞ FH Farming System Diagram). In addition, more information can be collected on the gender-based use and control of resources within the household, along with variations among the different socio-economic groups. ► Tool 3 Task Analysis by Gender, and ► Tool 4 Access to and Use of Resources included in **Part II** of this Guide may be useful in this process. (☞ FH Resource Picture Cards).

Key Questions for Analysis and Summary

- What is the place of irrigated agriculture in relation to rain-fed agriculture and livestock: share of income from each, average acreage, and role in provision of household food security, intra-household allocation of resources?
- What is the involvement of women and men in irrigated and rain-fed agriculture, across different socio-economic categories?
- Summarise women's and men's use and control of resources and benefits. How do they compare? How do resource patterns from the different social groups compare?
- Can households afford to adopt the proposed technical packages?
- Are assumptions about labour availability consistent with what is known about the gender division of labour and migration?
- Can the returns from proposed technical innovations compete with those of alternative activities?

In Zambia, as in many other Sub-Saharan African countries, women provide most of the time and labour input for smallholder irrigation. Yet, men often dominate the control and management of smallholder irrigation, especially where crop production has become semi-commercial and generates cash income.

Although changing this deeply rooted pattern requires much more than the efforts of an individual project, the WIN project, or in full, the Empowerment of Women in Irrigation and Water Resources Management for Improved Household Food Security, Nutrition and Health intends to contribute by broadening the scope of irrigation development and water resource management, involving women in project planning and improving their position in water resource management.

The project also addresses related issues, especially those that tend to bear on women more than on men, such as the (physical) transportation and marketing of irrigated crops, domestic water supply, sanitation, health and household food supply. Apart from Zambia, the WIN project is also implemented in Nepal and Cambodia (WIN Project, 2001).

1.3 Stakeholder Analysis and Participation

The planning of new irrigation development or the upgrading of existing systems is increasingly based on the process of stakeholder participation. In the SEAGA programme a stakeholder is anyone who has a direct or indirect interest in, or is affected by, or can affect the outcome of irrigation development. A stakeholder approach to irrigation development requires an understanding of priority problems and recognition of the stake of all participants in achieving the success of any irrigation project. Stakeholders may be identified through answering the questions:

- Who has or needs resources, like land and water?
- Who is affected by the use of these resources by others?
- Who influences decisions about these resources?

(☞FH and ☞IH: Matrix Approach to Stakeholders and Venn Diagram of Stakeholders, ☞FH Stakeholder conflict and partnership matrix + MH Strategic Interventions).

A key stakeholder in many irrigation programmes is the government, as a primary decision-maker and implementer of policies. Officials from a core ministry, such as Irrigation or Agriculture, and from other levels of government, including state or provincial authorities and local or municipal level officials, almost always have a stake.

Many individuals or institutions may be directly or indirectly involved or affected because of their technical expertise and private interest in irrigation policies and programmes; or they may be involved through links to those who are directly affected. Such stakeholders may include NGOs, various intermediary or representative organizations and private sector businesses.

Those directly affected by a proposed intervention are clearly among the key stakeholders. They are the ones who stand to benefit or lose from irrigation programs. They may include subsistence farmers, commercial farmers, landowners, tenants, cattle-herders and other water users. Poor and marginalized women and men are among these groups. In most irrigation systems, few women have official rights to land and water, which is why they are seldom identified as key stakeholders.

The priority constraints that stem from the current situation can be identified. Priority problems of women and men may differ, but they also overlap. Similarly, the priority needs of members of different socio-economic groups may differ in some respects and overlap in others.

☛ See **Part II** for Tool 7 – Problem Ranking and Problem Analysis Chart. (☞FH Pair-wise Ranking, Problem Analysis Chart). See also exercise 1D – Problem Identification of PT&E on FWM.

Furthermore, it is important to realize that different groups of stakeholders may not only have different stakes, but stakes that are conflicting. From an early stage these conflicting stakes need to be recognised and discussed. An example of a conflicting stake is the interest of fishermen in the management of reservoirs for cultivation of fish as opposed to male and female farmers who have an interest in using the same water for irrigation. Requirements for water management for fish cultivation and for irrigation may differ quite dramatically at certain times, and result in serious conflicts between different stakeholders.

In the interest of achieving increased efficiency and equality, all stakeholder groups should actively participate in discussions to raise priority problems that concern them. However, there are often specific restrictions, which can prevent women farmers, and especially female heads of households and marginal groups, to voice their opinion in stakeholder consultations. These restrictions need to be recognised, and strategies developed to tackle them in order to facilitate complete participation from the early stages of the planning through to implementation.

In the rehabilitation of Bauraha Irrigation system in the district of Dang in Nepal, women farmers were not involved in the planning and the design of the rehabilitation activities. The result was male-dominated problem identification, i.e. the high labour requirement for maintenance and repair. The constraint identified by women, i.e. water-shortage that resulted in competition for water with male farmers was not considered. Consequently the project replaced the brushwood intake structure by a solid trash rack-intake that would require less maintenance in future. Although the intake could easily have been expanded to increase the water flow, it was built with exactly the same dimensions (Bruins and Heijmans, 1993).

Contributions from members of marginalized groups may need to be especially sought. Some methods for ensuring their participation are: to form separate groups by gender, socio-economic group or age, to ask uninvolved observers whether or not they agree with what is being said or by engaging a dominant person in a conversation away from the group.

In most cases it can be assumed that women farmers, especially women heading their households and women from poor households, need and want a secure and independent access to land and water.

Stakeholder participation should be consistently emphasised in all phases of a project – and not just in the identification and preparation stage. Only then will local people become the owners of the changes they propose (Dijk, 1999)

Key Questions for Analysis and Summary

- Who are the stakeholders in the planned irrigation development? How big is their stake?
- What problems given priority by women? By men? What are the different problems identified by the various socio-economic groups?
- What are the current coping strategies? What are the gender implications? E.g. women go further and further to fetch water.
- Are there conflicts among the stakeholders? Are there existing partnerships between stakeholders?

1.4 Collection and Review of Data

Data collection normally consists of gathering existing or secondary data. However, this can present problems in that existing data often lack sufficient detail about gender and other important socio-economic variables. Another problem is that existing information is not always reliable. Therefore, new data in the form of surveys, case studies and rapid or participatory appraisal techniques should be collected in order to supplement existing data. In **Part II** of this Guide, some tools are included for the collection of data in a participatory and visual manner at community level.

Proper planning of data collection starts with answering the question: What do you need to know? Next, the plans for the processing and analysis of the data should include both the required time and capacity. It is advisable to prioritise within the information and data that are needed, as it is often better to have reliable and detailed data on a small range of issues than to be overwhelmed by too much information that may be superficial and unreliable.

Methods for triangulation of information must be used in order to cross check information for accuracy. Information may be collected from different sources and different groups of people, and several different tools can be used to gather information on the same issue.

For development of new irrigation schemes the following information may be required in addition to technical data²:

- details of existing land use, farm size, land tenure and water rights for both women and men farmers;
- demographic data, disaggregated by sex, age and ethnicity;
- number of male and female-headed households;
- farming system: local agricultural and livestock production systems data – including crop yields, (for both rain-fed and irrigated crops), and technologies used – for both women and men farmers as well as for households from different socio-economic groups;
- gender-based division of labour for the different crops;
- resources used by women, men and households from different socio-economic groups to carry out their activities; and
- assessments of market and price prospects, and access to these markets for both women and men.

In the case of an existing irrigation project (that is under consideration for rehabilitation and upgrading), in addition to the above, the following information may be collected:

- the social history of the scheme;
- the impact of the irrigation scheme on different socio-economic groups and on women and men farmers;

²Adapted from the Investment Centre Division (TCI), 1996

- existing cropping patterns, yields, and trends for both women and men farmers of different socio-economic groups;
- existing allocation of land within the scheme, female and male landowners and female and male land users of different socio-economic groups;
- water allocation and usage within the scheme, (with an assessment of efficiency), for both women and men farmers of different socio-economic groups;
- sex disaggregated farm income and off-farm employment data;
- organization and management structure of the irrigation scheme, gender-disaggregated; and
- technical and organizational constraints faced by women and men that influence scheme performance and benefit distribution.

Only part of the above information is likely to be available, and specific studies and surveys may be required. Apart from collecting information on the current situation, insight should be gained regarding ongoing processes of change. Collecting the above information for different periods in time, e.g. 20 years ago, 50 years ago and the present situation can obtain this. (⇒FH Trend lines).

Some insight into the potential impact of the irrigation activities, and women and men farmers' expectations and attitudes, could be gained by asking the following hypothetical questions:

- If the water supply were to increase, how would this change their cropping pattern? What other changes can be foreseen?
- What is their interest in participating in WUAs?
- What is their ability to pay water fees?

Key Questions for Analysis and Summary

- Is the existing information disaggregated by sex and by other important socio-economic variables? If not, what information is lacking?
- What method is most suitable to collect any missing information?
- Is the information collected from the different sources and methods accurate? How can contradictory findings be explained?
- What is the percentage of female-headed households for the different socio-economic groups? Is their number growing or decreasing? If so, why?
- Is there a need for further socio-economic study? If yes, what should be the scope and focus?

1.5 Mapping

Existing maps and aerial photographs are intensively used in the irrigation planning process. In addition, for example, women and men farmers' detailed local knowledge could be mapped for information on:

- existing water sources and water use;
- hydrological units and drainage system;
- agricultural lands, crop varieties and locations; and
- soil characteristics.

The primary concern is not with cartographic precision, but with obtaining useful information about local perceptions of resources. For example, maps of a village, an irrigation scheme, a swamp area or a watershed can be created. ► See Tool 1 – Resource Mapping in **Part II**. (☞ FH Village Resource Maps, Transects). See also exercise 1A – Mapping Exercise from Part A of the PT&E on FWM.

Key Questions for Analysis and Summary

- What is the opinion of local people about the water sources and soil condition? What is their opinion of the historical trend?
- Are the maps produced by the villagers identical to the official maps? Are there differences? How can these differences be explained?
- What new information results from the local level mapping and consultation?

The Andean Community Irrigation Project in Ecuador attempted to develop an irrigation scheme in the area by consulting and involving the farmers. Because many of the men have left in search of work outside the community, the majority of the farmers are women. Involving them in the planning was one of the major challenges of the project. Standard methods of encouraging community participation, like the distribution of leaflets and brochures, failed to capture this largely illiterate audience. Village meetings conducted in the native language of Quichua proved much more effective. The project also trained women to be irrigation leaders and promoters and provided them with technical skills. Next, the project co-ordinators used visual three-dimensional models of the project area to make the process more "farmer friendly". The farmers, who had a difficult time understanding topographical maps and technical jargon, found it easy to relate to the real-life models that showed the fields, mountains, main canals, villages, etc. The project leaders brought the models to them in their villages, enabling men and women to ask questions, bring up concerns, and make suggestions in the comfortable context of community discussions.

To share the lessons learned with others, the collaborating organizations documented their experiences on videotape and developed an irrigation project guide. These materials can be obtained through the International Water Management Institute (IWMI, iwmi-publications@cgiar.org)

1.6 Selection of Technology

The type of irrigation technology selected should correspond to the practical situations of both women and men farmers. During the selection of a certain type of irrigation technology, all handling and maintenance requirements need to be considered to ensure that the technology matches with the operational capacity and strength of both male and female users. This can best be done through close consultation with the users to avoid decision-making based on pre-conceived and possibly mistaken ideas. For a methodology on technology selection, see 1E – Identification of Technologies of PT&E on FWM.

Technology selection must take into account the following criteria in order to be appropriate for both women and men farmers:

- investment costs, in line with farmers' financial means, including availability and access to credit/saving plans for both women and men;
- investment costs that consider farmers' returns for both women and men;
- available cultivable area for both women and men;
- types of crops to be grown by both women and men;

- amount of labour required and available, for both women and men;
- maintenance requirements, expenses and availability of spare parts;
- the durability of the technology; and
- the physical strength needed for the operation of the technology for both women and men.

In Zimbabwe, women adopted sprinkler irrigation and they were among the first to acquire a good knowledge of it. However, the inconvenience of sprinkler irrigation for them was that it required frequent moving of heavy sprinkler laterals and thus the permanent presence for the women who live far from the schemes (Chimendza, 1989). Once these problems were recognised, the sprinkler laterals were successfully replaced by drag-hose sprinkler systems. Drag hoses do not require frequent moving and are much lighter to handle.

A greater acceptance of the chosen technology will benefit more farmers and help realize a project's full potential.

Key Questions for Analysis and Summary

- Does the type of irrigation technology match with the operational capacity of the users, in terms of demands on physical strength, maintenance requirements, time needed, etc?

1.7 Available Water Resources

The volume of water available for irrigation must be determined. After establishing the hydrological availability, the suitability of the water sources and competing water needs within the basin should be assessed. Use could be made of the exercises included in Module 1 on Water Sources of Part B of the Farmers' Training Manual PT&E on FWM. This module covers interventions in the field of Groundwater and Well Development, Pumps and Reservoirs and River Diversions.

SUITABILITY OF THE WATER SOURCE

In determining the suitability of the different water resources, an important consideration is the distance of farmers' homesteads from the irrigated fields. Whether a certain distance is acceptable to both women and men farmers should be discussed in meetings. The quality of the water also helps determine the suitability of the water source.

COMPETING WATER NEEDS

In addition to the irrigation water requirements, and in order to avoid possible conflicts between different water users, the estimated need of water for other purposes such as drinking water (for both humans and cattle), and the irrigation of homestead agriculture and trees should be considered in the calculations. It is also important to identify *and* anticipate hydrological, infra-structural and social linkages between the different uses of water (☞ FH Village Resource Map). ☉ Tool 6, Water Use matrix in **Part II** of this Guide analyses the different sources of water and their relative importance for its various uses.

Apart from quantifying the **amount** of water required for different water uses, the **timing** of water provision also needs careful consideration. Non-irrigation uses of water require a different, often more frequent timing than irrigation uses. Furthermore, the **quality** of water becomes more important, especially when used for drinking water. A possible health impact of an irrigation scheme may be the depletion or pollution of groundwater, which in many areas is used for drinking water and washing.

It is essential that the **watering of livestock** is included in the overall water plan. Livestock might be competing for scarce water, and be equally or more important for people's livelihoods than irrigated agriculture, thus deserving priority when water is limited.

A water crisis is increasing throughout the Usangu plains of Tanzania. The decreasing supply of water is caused by degradation of the upper water catchment area, combined with upgrading and expansion of traditional irrigation schemes, a high influx of cattle (estimated now at one million cattle heads), and a growing population in the plains.

In the Mahango scheme, FAO has assisted in the construction of an intake in a small river for the irrigation of women farmers' fields. In 1995, and again in 1996, a serious water management problem arose, not within the village, but with the village downstream whose inhabitants are predominantly cattle herders. In the dry season there is not enough water for all the different user groups. Conflicts centre on the gates that control the water flow; gate handles have been stolen and gates have been demolished. The villagers downstream are in the process of digging a deep trench, upstream from the intake, that will divert the water to their village. As a result no crops were cultivated during the 1996 irrigation season (Jordans, 1997).

In discussions with stakeholders, all water uses must be analysed, and a preferential ranking system implemented to result in a comprehensive water use plan. It is also important to guarantee the **reliability** of the water source, especially for drinking purposes.

The two following dimensions need to be considered:

- identification of the means to address differences in need and priorities arising from differences in activities and responsibilities; and
- identification of opportunities to address inequalities of access to and control over water resources (SIDA, 1997).

Key Questions for Analysis and Summary

- Is the irrigation scheme planned at a reasonable distance from the villages?
- What are the different water sources in the area? Is the water availability from these sources increasing or decreasing over the years? If so, why?
- What are the different uses of water in the area? What amounts of water are needed? What are the timing requirements? Are quality and reliability important? If yes, why and how can they be ensured?
- How can the competing uses of water be combined?
- How much can people afford to pay for water fees?
- Do all socio-economic groups, women and men in the area have equal access to water? Which groups have a constrained access? How could their access be improved?

1.8 Irrigation Water Requirements

For new irrigation developments, estimates of irrigation requirements need to be assessed for the range of possible crops and planting dates under consideration. Calculations of irrigation requirements are made by analysing climatic and crop data, verifying them if necessary, using computer programmes. The following considerations should be kept in mind when making assumptions on cropping patterns, including planting and harvesting dates, and calculations of peak water use.

CROPPING PATTERN

It is usually better to design schemes that allow for the production of different crops instead of mono cropping. Crop diversification allows women and men farmers to spread their workload, and it also caters to the needs of small farmers to minimise risks, satisfy household nutritional requirements and flexibly respond to market demands. ► See tool 2 Seasonal Calendar in **Part II** (☞FH Farming System Diagram, Seasonal Calendar).

Where women are responsible for different irrigated crops than men, they may also have different water needs regarding quantity, frequency and timing. These various water requirements must of course be reflected in the design of the scheme, in the cropping plan and consequently in the water requirement calculations.

Overall scheme performance can be negatively affected if women are not consulted on water schedules for different crops. Women farmers in Pak Cheng in the Mekong Irrigation Programme in Lao PDR stated that in the last dry season their second harvest of cucumbers was damaged because the water supply was stopped too early. A second vegetable crop was not listed in the cropping calendar and thus not included in the water rotation plan (MIP, 1991).

PEAK WATER USE

Peak water need is often calculated by engineers with the objective of minimising water use, thus allowing the maximum area of land to be irrigated given the amount of water available. Resulting designs are, for example, based upon the assumption that maximum use is going to be made of the available rainfall by the farmers, resulting in a certain planting date. This assumption will result in a scheme that prescribes the time to start the irrigated production, and requires that women and men farmers adopt the system of transplanting in the case of rice farming.

In practice, farmers might have a different objective, like minimising labour peaks or distributing their time and energy over irrigated and rain-fed agriculture. With that objective in mind, farmers may not want to work in irrigated fields at times when it is raining, as that is the best time to work on rain-fed fields. They may also not be able to adopt transplanting methods, as these require more labour than broadcasting. (☞FH Farming System Diagram, Seasonal Calendars).

In the Jahaly-Pacharr project in the Gambia, water requirement calculations started from the assumption that the peak water use should be as low as possible. This resulted in a cropping calendar based on transplanting, optimal use of the rainfall, and a peak water need that did not coincide with the land preparation period. Women farmers strove to minimise labour peaks, resulting in broadcasting of rice and a tendency to perform most tasks in stages, like weeding

and harvesting. This resulted in more water use and at different times than the scheme had been designed for. (van Hoof, 1990).

The net effect of taking certain constraints, e.g. labour, into consideration may be that peak water use is higher and thus a smaller area can be irrigated.

Key Questions for Analysis and Summary

- Will women and men farmers be able to grow any crop they want, or are there certain restrictions? If so, why?
- What are the periods when there is labour shortage due to competing activities? How will this influence people's allocation of labour to irrigated production?
- What effects will this have on water need, and thus on peak water use? Would this lead to a reduced maximum area that can be developed?

1.9 Institutional Capacity

In recent years, increasing emphasis is placed on the participatory planning and implementation of irrigation schemes, and on management transfer. Irrigation institutions need to evolve from the execution, operation and maintenance of schemes, to a more co-ordinating and facilitating role. In order to estimate institutional capacity for the integration of socio-economic and gender issues and participatory irrigation planning, it is important to:

- assess the capacity, at the **macro** and **intermediate** levels, of irrigation and agricultural service institutions to work in a participatory manner with all different groups of stakeholders;
- evaluate their motivation to work with and support women and men farmers and farmers from resource poor households;
- identify constraints and propose solutions, such as the training of existing staff or recruitment of additional staff.
- assess at the **field** level, the importance of and access to local groups and institutions for different socio-economic groups and for both women and men. (See **part B**, Tool 5 Venn diagram)
- consider at the **field** level, the opportunities and constraints for establishing or strengthening WUAs for new or rehabilitated schemes, and the opportunities for various social groups and women and men, to actively participate in decision making processes.

Over the past few years the Ministry of Agriculture, Water and Rural Development of Namibia has trained agriculture extension workers to use a participatory approach to "The Analysis of Difference" with FAO technical support. The emphasis is on learning about community/farmers' activities, resources, needs and priorities, and how these differ by gender, age, wealth, ethnicity and farming system. Some extension workers were selected to become trainers themselves. As a result, most Namibian extension workers

have been trained on the basic concepts of gender analysis and participatory methods (Wilde, 1996). The training in the "Analysis of Differences" should become a compulsory component of the Annual In-service Training Programme, as indicated in a letter from the Permanent Secretary of the Ministry of Agriculture, Water and Rural Development dated September 6, 1996.

An analysis of the performance of local institutions could serve both as an indicator for existing capacity, and to indicate fields for improvement (→FH Institutional Profiles and Community Capacity Building). The most challenging aspect is often for different institutions to co-ordinate their activities and co-operate towards a more integrated planning approach and joint implementation.

Key Questions for Analysis and Summary

- Are the concerned institutions able to co-ordinate with a participatory planning process?
- What is the attitude among the extension staff towards women farmers, and farmers from disadvantaged groups?
- What is needed to improve their ability to support the different needs of the various socio-economic groups?
- What mechanisms or committees for water management and control exist? How many women and men are members? Are the chairperson and secretary women or men?
- How can these local water management systems be strengthened?

1.10 Options Assessment

On the basis of an initial review of the data collected and stakeholder consultations, a preliminary assessment of the various options for irrigation development can be made.

Options can be compared on the basis of their impact on agricultural productivity, stability, sustainability, and equity. Further criteria could include the cost of the scheme, feasibility, and the time needed for its implementation. ► Tool 8, Options Assessment Chart, in **Part II** of this guide can be used. See also exercise 1E – Identification of Solutions of Part A of the Farmers' Training Manual PT&E on FWM.

Key Questions for Analysis and Summary

- Are certain options more favourable to women? To men? To certain socio-economic groups?
- Will there be losers and winners? Who will benefit the most? Who will not benefit?

1.11 Comparison of Likely Costs and Benefits

The main aim at this stage is to compare the likely social, financial, and economic performance of the available options in order to confirm that these are likely to be attractive to and adoptable by most farmers. It is also necessary to support the selection of the preferred options.

ESTIMATES OF PROJECT BENEFITS

Assessment should be made of the key parameters of yield expectations, cropping intensities, and prices for inputs and outputs, resulting in a simple farm model. Typically,

the project's benefits are aggregated together, but techniques can be applied to disaggregate them by different types of beneficiaries.

For example, an irrigation project may increase the value of land within the project perimeter, and the benefits can be disaggregated between women and men on the basis of the proportion of land owned by each sex. (☞MH Improving Monitoring and Evaluation).

It is important to base estimates of yields and cropping intensities on the foreseen amount of labour and other resources that will be devoted to the irrigated production. In producing the farm model, the assumption that households pool all resources of land, capital and labour, and allocate resources where they are most useful to the household as a whole must be avoided. Instead, it should be recognised that male and female members within farm households may have shared, separate and conflicting interests at any given time, and could wish to use resources in different ways.

An irrigated rice project in North Cameroon failed to attract sufficient farmer interest, with the result that about a third of the developed area remained uncultivated. A contributory cause was the inability of the project to adjust to intra-household conflicts between women and men with regard to labour allocation, control of crops and monetary rewards (Jones, 1986).

In estimating the benefits, it is important to assess market and price prospects in order to establish that market openings exist or can be created for the incremental output expected to result from the project, and how this will impact upon producer prices. Note should also be made of the adequacy of crop processing practices, distribution and storage facilities, as well as the presence and current utilisation of agro-industries.

Because we increasingly recognise the fact that poverty and unemployment arising out of the unequal distribution of benefits will compromise sustainable growth, it is crucial to monitor the distribution of benefits. If most benefits accrue to certain individuals, such as large landowners, local politicians, or men, while other groups such as marginal male and female farmers, female-headed households and certain ethnic groups lose out, the overall impact may be negative.

PRELIMINARY COST ESTIMATES

Both initial capital and operating costs should be estimated. As a result of the privatisation process, it is expected that farmers will pay part of any construction, operation, and maintenance costs. It is important to consider whether the level of women and men farmer's contributions and water fees is reasonable. Unreasonably high costs could lead to the selection of other technologies that are cheaper to construct, operate and maintain.

Key Questions for Analysis and Summary

- What are the main benefits of irrigation development for each socio-economic group, and for women and men?
- Are there groups that do not benefit at all? Will some groups be affected negatively? How are these groups going to be compensated?

- What incentives are needed for each socio-economic group, and women and men, to invest resources in irrigated agriculture?
- What is the domestic and export demand for irrigated crops? What are the market prospects?
- What are the implications of the current marketing system for potential cropping patterns?
- How is marketing of agricultural produce carried out? What is the role of women and men within the marketing process?
- Do appropriate post-harvest technologies and facilities exist?

1.12 Conclusion: Achieving Consensus

The output of the identification and preparation stage, as described in the above paragraphs, will lead to the definition of the project goal and purpose.

Irrigation may be a feasible option if there is a broad base of support, substantial pressure for agricultural change, and it is among the top priorities of many of the stakeholders identified. Consensus at the macro-level is required in order to assure that irrigation is a justifiable option for use of available water in a particular area, according to the national or regional Water Resource Policy plan, and that consequent water rights will be guaranteed (→MH Developing Gender Sensitive Sector Policies).

At the intermediate level, institutions are responsible for implementing the policy decisions taken at macro level, as well as for incorporating the priorities and plans of both women and men farmers. They establish the link in the decision-making process, and are instrumental in reaching a consensus.

At the **field** level, within the communities concerned, the whole process of participatory irrigation planning should result in a concrete and realistic goal and purpose that meets the needs of both women and men. (→FH Preliminary Action Plan, Best Bets Action Plan)

It is often desirable to conclude the identification/preparation stage by holding a workshop that should be attended by as many stakeholders as possible. The objectives should be to:

- seek opinions from the stakeholders, and to arrive at or advance towards a consensus on the project goal and purpose; and
- discuss the work involved in further design, the responsibilities for undertaking this, and the agreement on a work time frame.

See also exercise 1F – Preparation of a Seasonal Farmers’ Water Management Plan of Part A of the Farmers’ Training Manual PT&E on FWM.

Key Questions for Analysis and Summary

- What consensus is reached on the irrigation project goal and purpose?
- What activities need to be implemented in the design stage? Who will implement them?
- How will further stakeholder participation be organized?

2 DESIGN

The challenge of the design stage is to ensure that the project's design reflects the views expressed by the different groups of participants. Amongst other things, modern irrigation design criteria are intended to:

- match design to users' wishes, because irrigation is a service to farmers which should be as convenient and efficient as possible;
- complement the local organization of labour;
- allow for freedom of crop choice; and
- optimise local decision-making on technical issues such as site, plot size, methods of field irrigation and number of participants, using participatory approaches in the context of local farming systems and conditions. (Wolter and Burt, 1997; FAO, 1996)

In addition it should be ensured that the design is:

- institutionally workable;
- unlikely to result in any adverse social impacts without adequate compensation; and
- technically, environmentally and fiscally sustainable.

The translation of information into *project outputs and specific activities* or *inputs to be implemented* is needed. This can be achieved through a continuation of the participatory planning process. Provided that the planning and design process is truly participatory, and that all socio-economic groups and women and men are equally considered, it is more likely that gender aspects will be better integrated into irrigation programs from the early stages of the design process (Facon, 1995).

Use could be made of the exercises included in Module 2 on Farmers' Irrigation System Improvement of Part B of the Farmers' Training Manual PT&E on FWM. This module covers the planning of interventions in the field of Canals, Irrigation Structures and Water Distribution, and System Maintenance.

2.1 Detailed Studies

More in-depth socio-economic information is required in order to incorporate socio-economic and gender issues into the design of the project. Depending on the nature of the project, the following studies and surveys may be required.

SOCIO-ECONOMIC AND PRODUCTION SYSTEMS SURVEY

This survey is used to verify the underlying assumptions of the project, as well as any perceived problems, priorities and areas of convergence or divergence between government and the intended users. The survey should assist in assessing the farmers' perceptions and likely responses to the opportunities and demands of the project. The survey may employ rapid rural appraisal techniques and should be a continuation of the participatory planning initiated during the identification/preparation stage, (TCI, 1996),

thus supplementing the data previously collected. The investigations should be designed to establish:

- the extent of farmer interest in the project and the implications for project planning; (problems, constraints and means of overcoming them, from the farmers' perspective);
- gender relations and disaggregation of labour by sex, (access to and control over land, labour and capital, control of crops and income from their sale);
- household economy;
- conflicting or competing demands for labour;
- likely impact of the project on any of the above; and
- the scope for cost recovery, including contributions towards capital costs and recovery of operation and maintenance (O&M).

LAND TENURE AND WATER RIGHTS

The existing arrangements, customary or otherwise, for land tenure and water rights must be examined in detail. This should establish whether there might be any obstacles to successful implementation, such as lack of secure tenure or water rights, which could inhibit participatory development and capital cost contributions by the users. There may also be a need to examine and conduct inventories of water rights. (TCI, 1996).

Land tenure and water rights arrangements should be examined for each socio-economic group, and for women and men. If there are differences in access to land and water between these groups, or between women and men, the potential effects on the implementation of the irrigation programme should be assessed. Likewise, the possible impacts that an irrigation project may have on existing land tenure and water rights arrangements in the area should also be assessed.

In situations of **existing land ownership patterns**, the participants in the scheme are partly determined by land ownership and also by the topography of the command area. Landless people and farmers who own land too far away or on high ground are thus excluded. Therefore, participants will probably be landowners from various socio-economic groups with land in the command area. However, there is some scope to involve those excluded through redistribution of land ownership or arrangements for leasing or sharecropping of land.

On the other hand, many large irrigation or resettlement schemes are planned in areas with **no previous land ownership** patterns. In those cases newly developed irrigation plots need to be allocated or sold to farmers. In these situations, it is important to consider issues like equality between the sexes.

Existing land legislation and customary rights related to land use, as well as national policies on land tenure, need to be examined and followed. For example, in Tanzania an Amendment to the Land Law in 1997 guarantees equal access to land for both women

and men. This is something that should be brought to the attention of male and female stakeholders in the project.

Strategies identified to promote more equitable access to water and irrigated land for women and men could, depending on the local situation and in co-ordination with the community, include measures to:

- conduct more in-depth research into the local legal position of women and men concerning their access to and control over natural resources;
- support national, regional and local advocacy groups that aim to enhance and enforce the legal rights of women;
- provide legal education for women and men, as well as for government and other organizations staff;
- allocate irrigated plots to women identified as heads of farm households;
- put the title to irrigated plots in joint names of the couple or divide family land between husband and wife/wives with individual titles;
- promote collective land and water rights for women, especially for women from marginal groups;
- promote the organization of women groups to claim and protect their rights; and
- pay attention to measures that secure land and water rights of women in male-headed households, so that they are able to continue to farm the land upon the death of the husband or after divorce (Fong and Bushan, 1996, Benda-Beckmann et al., 1996).

With irrigation becoming an increasingly private investment, access to capital becomes a determining factor for access to water and land. Water markets are being established where water is for sale. A strategy to increase women's access to land and water should include the increase of their access to capital and credit. Once land and water rights are established, access to capital and credit is crucial for a productive use of land and water, and this influences the ability to control land in the long-term.

In addition, proper compensation mechanisms need to be developed and implemented for people who:

- will be displaced, because their land or houses will be flooded by a reservoir, or their land will be needed for construction of embankments, canals and roads; and
- whose livelihoods, trades or occupations will be adversely affected, e.g. cattle herders, women farmers who used to produce vegetables on wetlands following the rainy season.

It should be ensured that the description of "affected people" (stakeholders) includes all categories of people, not only landowners, but all land users: women and men, adults and children, etc.

It is considered normal practice to register plots in the name of the head of the household, the majority of whom are men. However, a number of studies in Africa

suggest that individual plots might be more efficient, as allocation and registration of irrigated plots to men appears to be one of the main causes for the disappointing performance of irrigation projects in West-Africa (e.g. Carney, 1988; Dey, 1990; Jones, 1986).

The Dakiri irrigation system is one of the few systems in Burkina Faso where women obtained irrigated plots on an individual basis: 60 women (or 9% of the total number of plot-holders) have an individual plot. Most of their husbands also have plots. A case study carried out in 1995 showed that both the productivity of land and of labour are higher where both men and women have a plot, than households where only men have been allocated plots. The study further shows that women are equally good or even better irrigating farmers than men, while their motivation to invest labour in irrigated production significantly increases when they have their own irrigated plot (Zwarteveen, 1996).

Therefore, specific attention needs to be paid to documenting land rights, especially of vulnerable groups and female-headed households. It is fundamental to secure the rights of women, in male-headed households, to continue farming the land upon the death of their husbands or after a divorce. This is especially important as it offsets the occurrence of “property grabbing”, whereby in-laws or other groups in the community obtain the property of widows or vulnerable groups. In areas where there is resistance to land rights for women, the allocation of land to groups of women can be a strategic first step.

A discussion should be started with the farmers, village councils and government representatives concerning the allocation of plots on an individual basis as compared to a household basis. Consequently, a decision needs to be made regarding equitable and efficient plot distribution.

Key Questions for Analysis and Summary

- What is the existing land tenure pattern in the area? Are inheritance patterns matrilineal or patrilineal?
- How are water rights obtained and distributed?
- What equality measures are needed? Will newly developed land be equally distributed? On what basis will land be allocated? Will some groups be privileged over other groups?
- Are previous users of the land compensated?
- Have provisions been made for female-headed households and for women in male-headed households to obtain land titles? Have measures been taken for women to register as tenants upon the death of their husbands?
- What are men farmers' preferences: household plots or individual plots? What are women farmers' preferences?
- What is the most equitable and efficient plot distribution?
- How can property rights best be secured?

2.2 Design Choices

In the design of each irrigation scheme, several “technical” issues should be decided through participatory approaches. These include issues such as plot size, infrastructure layout and facilities for other uses of water.

Therefore, draft designs need to be prepared, presented and discussed with the stakeholders at various stages, in order to arrive at a design that is acceptable to them. Some of the following issues could be discussed.

IRRIGATION SYSTEM

Participatory design approaches are essential in order to match the new physical infrastructure with an existing social structure.

The project team of a small-scale irrigation project in the Peruvian Andes conducted a two-day workshop as a first step in an interactive design process that incorporated farmers’ priorities. Technical aspects, such as location of canals and reservoirs, were discussed alongside social considerations, such as existing traditional organizations and water rights. Field visits were made to the irrigation scheme, and participatory mapping followed the fieldwork. Farmers mapped their own designs and engineers theirs. The best design was chosen from among four options. The users opted for a system with four reservoirs in order to be able to maintain the present social structure and thus planned to adjust the physical infrastructure to it (rather than the reverse, as many engineers tend to do). (Dijk, 1999).

SIZE OF PLOTS

As has already been indicated, the feasibility of “family plots” that utilise all available family labour must not be automatically assumed. In the calculation of an optimal plot size, the actual division of labour, access to income, as well as competing demands for labour on other farm and household enterprises need to be taken into consideration. Both women and men farmers should be consulted for their opinions on the optimal plot size.

To increase the flexibility of the system, it is important to design plots of different sizes, or plots with the possibility of subdivision.

INFRASTRUCTURE LAYOUT

Final decision on canal layout, drains and feeder roads should be based on consultations with all participants.

In the Visayas Communal Irrigation Project in the Philippines, farmers organized into WUAs undertook some of the detailed technical planning. Farmers responded positively to the project's proposal by reviewing the surveys and designs prepared by the National Irrigation Administration and make suggestions for adaptations. WUA members actively offered suggestions regarding the alignment of canals, placement of structures, capacity of canals, changes in head works and the design of field outlets. In the majority of cases, the Project Management Unit incorporated the ideas and suggestions offered by the farmers into the design. As a result of this participatory approach, irrigation canals were modified to suit local conditions and simple and easily manageable structures were constructed. In over 60% of the cases, the canals were realigned in order to satisfy the requirements of the farmers. Similarly, the capacity of canals, and in some cases irrigable areas, were increased and extended on the basis of suggestions received from members of farmers' WUAs (IFAD, 2000).

All landowners and land users must be present in meetings where infrastructure layout is analysed, as some land may need to be acquired for construction. Equally, they must be informed of and benefit from, the compensation mechanisms if land or homesteads are lost due to acquisition by the irrigation development agency.

A survey in the Mekong Irrigation Project in Laos found that a quarter of the plots in the irrigated area were inherited and managed by women. However, women did not attend the meetings where the design of the canal system was discussed, even though it was in these meetings that it was decided through whose plots to construct the canals. Had they been able to be present, female landowners might have been able to influence the canal layout decisions, and been informed on the compensation processes (MIP, 1991).

DESIGN FOR OTHER USES

- **Drinking water:** In cases of groundwater utilisation for irrigation, for hygienic reasons and convenience, two wells could be constructed or drilled simultaneously: one for irrigation and one for drinking water. Otherwise, facilities could be constructed so that water can be drawn from the same well in a hygienic way. It is important to guarantee the reliability of the drinking water well, especially in the dry season when all irrigation wells are running at full capacity.
- **Irrigation of homestead agriculture/trees:** The possible construction of extra inlets or pipe connections in order to facilitate and optimise homestead and tree productivity could be studied.
- **Livestock:** It is to be expected that small animals and livestock will be attracted to irrigated areas because of the abundance of water and weeds growing around irrigation and drainage canals and irrigated fields in an otherwise dry area. Therefore it may be wise to study and plan some permanent structures for livestock watering. For example, concrete or metal water troughs that are automatically filled. In addition, access routes may have to be planned to allow livestock to move freely between their usual grazing grounds and the watering places; thus fencing might also be necessary. The possible existence of land/water available to irrigate fodder crops should also be studied. These measures might avoid some of the expected disturbances created by the animals.
- **Washing of clothes and utensils and bathing:** The possibility of constructing special washing sinks, slabs or other constructions to facilitate washing activities

should be examined, and if possible, facilities for the bathing of livestock. In addition, steps could be constructed in a few places to make it easier to reach the water level in the main canals.

Key Questions for Analysis and Summary

- In determining the plot size, has the household pattern of labour allocation of its female and male members and the distribution of benefits been taken into account?
- Have all stakeholders participated in decisions regarding the infrastructure layout?
- Does the design cater for multiple water uses?

2.3 Water Management

A proper design of the technical and social water management structure is a crucial step in the planning of any irrigation scheme. Water management includes the design of a water delivery system as well as the social organization of water management through, for example, WUAs.

WATER DELIVERY SYSTEM

Apart from actual water availability and technical considerations determining the optimum water delivery system needed to efficiently irrigate all plots in the scheme, the planning of irrigation schedules could take into consideration the following issues:

The irrigation schedules must be simple, particularly in those schemes where many farmers are involved. It will often be necessary to discuss with the farmers the various alternatives and come to an agreement which best satisfies all involved parties (FAO, 1989). It is important to guarantee that in these discussions all groups of farmers, small and large, head-end and tail end and both women and men are properly represented.

In cases where water is not a limiting factor, on-demand water delivery ensures an adequate and timely water supply for the farmers. Given the workload of women in agricultural activities, on-demand rotation is often convenient for them in terms of being able to plan their work flexibly. A disadvantage might be that influential male irrigators can better defend their interests than vulnerable or female irrigators, whose “demands may not be heard”. During peak periods especially, such as land preparation or transplanting periods, less influential farmers, notably women farmers, could have problems securing their water turn.

A woman farmer in the Bauraha Irrigation system in the district of Dang in Nepal described the period of peak demand as follows: "When I want to transplant my rice I have to go to the water distributor and ask him for water. I have to convince him and all the other male farmers that I too need water. It is difficult for me to get my turn. For us, the women, this is a major problem" (Bruins and Heijmans, 1993).

A scheduled water delivery or rotation system has the advantage that it guarantees a regular supply of water to each plot, although timing might be less convenient and quantity not always adequate, especially in the tail end of the scheme. If possible a design that plans for night irrigation should be avoided as it might not be socially acceptable, and could also be dangerous for women to go out at night for their irrigation turn. During planning meetings with the farmers these issues need to be discussed, and a decision reached on what type of water delivery suits everyone best.

In a scheduled rotation system it is crucial for all groups of farmers to have access to information regarding the timing of their water turn. Women may have less access to this information than men do, which sometimes results in the loss of all or part of their water share.

WATER USERS' ASSOCIATIONS

In the context of privatisation processes and decentralisation, irrigation management transfer entails the turning over of operation and management responsibilities from government agencies to the private sector, in practice very often to WUAs or to water companies.

In most irrigation projects women appear to be virtually absent from Water Users' Groups, or if they are members they may not have much decision-making power, even in situations where their role in water management and use is very substantial. This is partly because membership is often confined to one member of each irrigating household, i.e. the "head" of the household, or is based on land ownership or land use rights. The criteria for both landholder and head of household apply to men more often than to women (Zwarteveen, 1995).

The International Irrigation Management Institute (IIMI) conducted a study of a farmer-managed irrigation system in Nepal showed that the discrepancy between women's involvement in irrigated agriculture on the one hand, and their absence in water users' organizations on the other, negatively affected management performance. The female heads of farms used more water than their official entitlement, while at the same time contributing less labour to maintenance than they should. This occurred because it was difficult for the system's organization to enforce their rule on women, who were not members. Although non-membership is thus in the interest of female farmers because it allows them more access to water for less input, the long-term sustainability of the irrigation system is at risk (Zwarteveen and Neupane, 1995).

Limited access for women to WUAs and decision-making structures can further be caused by:

- gender insensitivity of project staff involved in the formation and training of WUAs;
- irrigation and water management being perceived as "masculine" tasks in many societies;
- women's low literacy level as compared to men's; and
- local traditions.

Mechanisms are needed to ensure that women are included in the membership, decision-making committees and the irrigation professionals of the WUAs. Specifically, WUAs can:

- abolish the one member per household rule, and allow dual or multiple membership within a single household;
- reserve positions for women farmers in WUAs to ensure proper representation of the needs of all farmers;
- allow men to designate their wives as members and vice-versa, and establish liberal membership recruitment procedures;
- set targets for the percentage of women members in WUAs that correspond to the actual participation of women in irrigated agriculture;
- ensure that women members also play a decision-making role in the associations. This may, for example, require specific training and support to overcome cultural constraints, e.g. women who are not used to speaking in public or in mixed groups. Separate preparatory meetings might also be required in which women prepare their points of view and reach consensus on certain issues, which they can then present in the mixed meetings; and
- give both women and men responsibility for water management, such as the operation of gates, guarding the water flow or the distribution of water.

The definition of membership has important implications for equity. Organizational structures that provide for the representation of vulnerable groups, small farmers, women farmers and tenants increase equity. This may also result in the increased efficiency of the scheme.

In Tanzania the involvement of women in decision-making positions in WUAs has resulted in fewer operational problems and better financial recovery of operating and maintenance expenses, compared to WUAs where only men are involved (Masija, 1996).

Assessment could also be made of whether it is appropriate to include a number of water users who use water for purposes other than irrigation in the WUAs. This might lead to a more formal group that can co-ordinate the different uses of water and resolve possible conflicts among various groups of users. For example, in The Upper East Region Land Conservation and Smallholder Rehabilitation Project (LACOSREP) in Ghana, WUAs were composed of members of three groups of predominant stakeholders: gardeners, livestock owners (coinciding or not with gardeners) and fishermen (IFAD, 2000). (⇒FH Stakeholders Conflict & Partnership Matrix)

The above options for action may be more feasible in some socio-cultural contexts than in others. The question should be asked: What is feasible and practical in the current context? Decisions should then be based on discussions with the women and men water users.

In the Philippines, several irrigators' associations insisted on including both husbands and wives as members. One reason for this was that it allowed more flexibility: the woman, the man or both would be able to attend the meetings. Another reason was that, even though agricultural decision-making is very much a joint affair of both husband and wife, women and men have distinct domains of influence. As most women control the cash flow within the household, it was found that, unless the women were involved in formulating policies regarding irrigation and membership fees collection schedules, associations encountered problems when collecting irrigation fees. Community organizers also learned that unless women were encouraged to participate, financial obligations of farming households could not be guaranteed (Illo, 1988).

The exercises included in Module 5 on Water Users' Associations of the Farmers' Training Manual PT&E on FWM could be used for this purpose. This module covers interventions in the field of WUAs, and especially the Development of Farmers' Co-operation and Defining Rules and Regulations.

Key Questions for Analysis and Summary

- Does the rotation schedule suit most farmers? Does it allow vulnerable groups of farmers and women to receive enough water at the right time?
- In the selection of members for the WUA, are women and men farmers, from subsistence to rich being equally involved? Are women farmers equally represented? If not, why not? How can their participation be increased?
- How can women's role in decision-making processes be enhanced?
- How can representatives from different user groups be involved in water management?

2.4 Credit/Saving

Often one of the main constraints for smallholder farmers who need to increase their productivity is limited access to credit and agricultural inputs. Expected results of irrigation schemes, i.e. increased crop production and thus increased income, will not materialise if certain groups of male and female farmers are excluded from access to credit. Without access to credit they may not be able to invest in irrigated production, such as the procurement of inputs and payment of water fees.

Women's access to credit is more restricted than that of men, as credit is often disbursed on the basis of land titles or other guaranteed resources that are often in the names of the men. Therefore women's group credit and saving schemes can be extremely important in order to provide collateral for future loans, and to enable women to resist claims from men on their savings.

Access to agricultural credit needs to be facilitated, and group savings schemes for both men and women should be promoted.

Field experiences with credit schemes have shown that in general, rural women are good credit "risks". Their loan repayment record has usually been high and invariably better than that of men in similar circumstances. Women have proved to be more self-disciplined in repayment, take their loan obligations more seriously and are more afraid of defaulting compared to men (Tilakaratna, 1996).

Key Questions for Analysis and Summary

- Do both men's and women's credit and savings groups exist, or are women and men involved in mixed groups?
- Are there any special obstacles for marginal farmers or women to obtain agricultural credit? If yes, how can these obstacles be removed?

2.5 Monitoring Indicators

Specific outputs of the project need to be formulated using indicators. These indicators provide an objective basis for the monitoring of progress and the evaluation of final achievements. A good indicator should specifically define the level of achievement: *Quantity – How much? Quality – How well? Time – By when?* (⇒ IH Quantitative and Qualitative Information)

Indicators need to be formulated to monitor and evaluate the **process**. For example, indicators could include farmers' participation rate, amount of credit received, amount of credit repaid, crops grown, training attendance, etc.

Another set of indicators would need to be formulated to monitor and evaluate the **impact** of the project activities. Indicators could include yield increase, income gains, environmental effects, changes in workload, impact on nutrition of household members, the ratio between investments and benefits, etc. They can also include both process and impact aspects at the same time.

The indicators also need to explicitly disaggregate the information by both sex and different socio-economic groups. In practice this means, instead of monitoring the number of farmers participating in the irrigation scheme, data needs to be gathered on the number of male and female farmers from the different participating socio-economic groups. Equally, information on yield increases needs to be distinguished on the basis of gender of the household head, large-scale farmers versus small holders, and by different ethnic groups if applicable.

The definition of monitoring indicators could also be decided in close consultation with both women and men farmers as the initial step in a participatory monitoring system. ◉ See tool 10A in **Part II**.

The aim of collecting disaggregated monitoring data is that it may yield valuable information that can lead to measures to improve the programme, and especially the performance of specific groups of cultivators.

Key Questions for Analysis and Summary

- Is it possible to disaggregate the indicators by socio-economic groups? By gender? If so, how? If not, why not?
- What are the best indicators to measure progress?
- What are the best indicators to measure impact?

MONITORING INDICATORS AND THE LOGICAL FRAMEWORK

The logical framework or logframe approach to project planning is an analytical tool used to plan, monitor and evaluate projects. It derives its name from the logical linkages set out by planner(s) to connect a project's means with its ends. It relates the goal, objectives, outputs, activities and inputs of the project. A generic project logframe consists of a four by four matrix.

From top to bottom, the rows are labelled as follows: **goal, purpose** (also referred to as objectives), **outputs** and **activities**. The four columns are labelled as follows: the **narrative summary, objectively verified indicators, means of verification and assumptions**.

Thus, the logframe uses “objectively verifiable indicators” for each level of the project. Indicators are quantitative and qualitative measures of tangible project achievement. The logical framework is used by many bilateral and multilateral development agencies as a tool for planning and monitoring development projects (Hambley, 2001).

INCORPORATING SOCIO-ECONOMIC AND GENDER ISSUES INTO THE LOGICAL FRAMEWORK

The conventional use of the logframe warrants critique because it has often been gender-blind (Hambley, 2001).

Since the logical framework is built upon the goal, it is crucial that the overall goal is phrased in such a way that it reflects socio-economic and gender-based differences. This then translates into specific objectives, outputs and activities, which need to be measured on the basis of indicators.

In order to assist with the process of incorporating socio-economic and gender issues in the logframe, the following four by four logframe matrix presents some questions that can be asked at each level, as well as issues to consider (adapted from Hambley, 2001).

	Narrative summary	Objectively verifiable indicators	Means of verification	Important assumptions
Goal	Is the project goal phrased in such a way that it addresses socio-economic and gender differences?	How can one verify the achievement of the socio-economic and gender-conscious goal?	Socio-economic and gender disaggregated data + SEAGA Tools	What external factors are necessary for sustaining the gender-conscious goal?
Purpose (or objectives)	Does the project have gender-responsive objectives?	How can one verify achievement of the gender-conscious objectives?	Socio-economic and gender disaggregated	What external factors are necessary for sustaining the

			data + SEAGA Tools	gender-responsive objectives?
Outputs	Is the distribution of benefits taking gender roles and relations into account?	<i>Impact:</i> To what extent do project benefits accrue to women and men of different socio-economic groups engaged in or affected by the project?	Socio-economic and gender disaggregated data + SEAGA Tools	What external factors are necessary for achieving project benefits?
Activities	Are gender issues clarified in the implementation of the project (e.g. in work plans)?	<i>Process and Inputs:</i> Number and extent of participation of men and women of different socio-economic groups.	Socio-economic and gender disaggregated data + SEAGA Tools	What external factors are necessary for completing the activities?

2.6 Project Costs

At the end of the design phase a consensus should be reached on project outputs and specific activities. These can now be budgeted.

Cost estimates must be prepared for the various project outputs and specific activities. These estimates should consider the following aspects of socio-economic and gender issues:

- institutional support to increase the capacity of institutions to plan and implement the project, e.g. provision of experts on gender issues in irrigated agriculture and on participatory planning;
- crop development aimed at both irrigated and rain-fed crops grown by women and men farmers;
- training to improve staff and farmers' capabilities, e.g. gender and irrigation training;
- research support aimed at the proper inclusion of socio-economic and gender issues in all research and data collection efforts;
- water supply, sanitation and other infrastructures which facilitate use of water for non-irrigation purposes; and
- project co-ordination, specifically for the implementation, management and monitoring of the project, e.g. additional staff and transport and costs for a socio-economic and sex disaggregated monitoring system.

It is important to include additional costs in the budget in order to facilitate the socio-economic and gender-responsiveness of the project. Even if precise costs are unknown at the time of formulation, it is important to consider estimated budget items. Budget availability is often a determining factor in the extent to which an irrigation programme can respond to specific constraints, concerning vulnerable groups or women, which may become apparent later in the project (if they were not included in the identification stage).

Key Questions for Analysis and Summary

- Are additional costs for socio-economic and gender activities included in the budget? If yes, what is the percentage of the total budget? If not, why not?
- Is gender expertise budgeted for?
- Are mitigating measures for social and environmental effects included?

3 IMPLEMENTATION

3.1 Construction

If you involve participants in actual construction activities this can increase stakeholder commitment to water management, as well as to the maintenance of the irrigation system.

Groups of farmers could carry out these activities under contract arrangements with the project, so that they get paid for their contribution. In many situations this is done either through cash payments or “food for work” arrangements. The World Food Programme operates this type of scheme and it can be done in collaboration with them. In other arrangements “free” labour contributions are expected from farmers, leading to subsequent plot or water rights during implementation.

Specific attention needs to be paid to how property and use rights for irrigation water and land are created and enforced, with an emphasis on possible gender differences in both the willingness and the ability to invest labour or other resources in construction work and maintenance. Female-headed households often face a seriously constrained labour availability, especially for these kinds of additional activities. In addition, women farmers who participate in construction activities need to receive compensation equal to that received by men farmers.

In other cases, contractors, who employ paid labour, are engaged for construction work. The concept of “Equal pay for equal work” should be promoted, which ensures that male and female labourers receive the same wage for the same type of work. Proper and safe working conditions need to be ensured, and adequate quality control systems are essential.

Thousands of women and men were employed as construction workers when a large irrigation canal was built in Andhra-Pradesh in India. In construction, as in agriculture, the sexual division of labour is explicit: women carry head-loads of earth and concrete, sieve sand, and so forth, whereas men dig, mix the concrete, and perform other such tasks. However, the women were paid a lower wage than the men. (Ramamurthy, 1991).



Extension poster for discussion of the involvement of women and men in construction activities in the Cidurian Project, Indonesia

Key Questions for Analysis and Summary

- How much labour do male participants want to contribute to construction? How much labour do female participants want to contribute? Is the labour contribution fairly distributed over the various participants?
- Does contribution of labour lead to land or water rights? What is the penalty for not contributing? Could exceptions be made for single-headed households, who have less labour to spare?
- Can an “equal pay for equal work” system be enforced?
- What quality control mechanisms are in place?

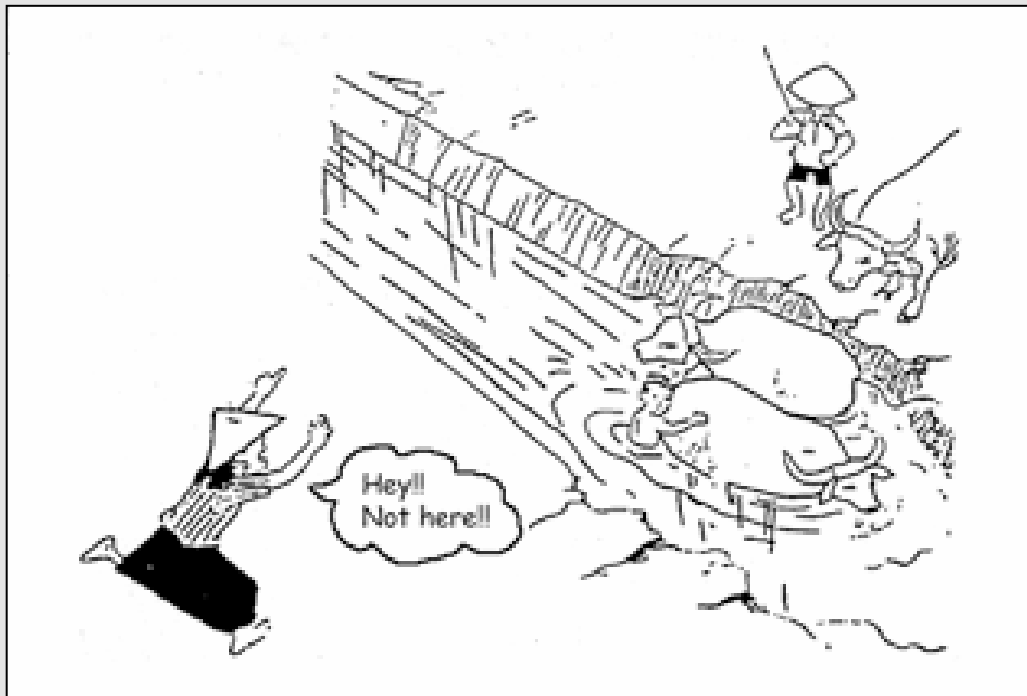
3.2 Operation and Maintenance

The lack of direct interaction and dialogue between irrigation agencies and water users in the operation and maintenance of irrigation systems has been identified as a major cause for the poor performance of some schemes. Increased water user participation in water acquisition, water allocation, system maintenance and resource mobilisation is now widely advocated as a means of improving irrigation performance. Until now, the need for women farmers' involvement in operation and maintenance has not been automatically recognised, even though their role in actual water management might be substantial.

During the training of women and men farmers, use could be made of the exercises included in Module 3 on Field water Management of the Farmers' Training Manual PT&E on FWM. This module covers interventions in the area of Field Irrigation Practices and Crop Water Management.

The Cidurian Upgrading and Water Management Project in Tangerang, West Java, conducted a survey that highlighted women's active role in the management of irrigation water. Women performed tasks such as:

- monitoring water conditions in the fields;
- controlling intake and outlet of irrigation water to the fields;
- arranging the distribution of water between users' fields;
- communicating with the water master and other water users;
- paying the water master when he came to their houses to collect his share of rice;
- controlling buffaloes which are the main cause of damage to the canals; and
- using tertiary irrigation water for household purposes (Dok et al, 1992).



Extension poster for discussion of the role of women in buffalo control, Cidurian Project, Indonesia

One or more of the measures described in section 2.3 of this Guide could be implemented in order to make women farmers more “visible” as users and irrigators, and consequently increase both their participation and their decision-making role in WUAs.

► The organization and effectiveness of Water Users’ Groups could be assessed and discussed using Tool 9 – Water Group Functioning in **Part II** of this guide.

As participating women and men farmers are increasingly responsible for managing irrigation schemes, they also are in charge of maintenance activities. WUAs sometimes collect water fees that are used to pay labourers for maintenance activities such as clearing canals or drains. In other cases, farmers themselves contribute their own labour according to certain agreements.

In the same way as women heads of households face problems regarding labour for construction activities, it might sometimes be difficult for them to contribute labour for maintenance activities as they face different labour constraints within those households.

Therefore, the operation and maintenance system that best suits most users should be decided upon through a consultation process with those users.

The norm in Santa Rita and San Marcos in Peru is that men participate in canal cleaning and system maintenance. Widows and women with absent partners are expected to send a family member, hired hand, or cash contribution to fulfil their labour obligations. Women heads of households who cannot afford this have to violate cultural norms. They are forced to participate in the community labour force themselves, to safeguard their water right (Lynch, 1991).

Key Questions for Analysis and Summary

- Is the WUA active in the operation and maintenance of the scheme? If not, what are the reasons for poor management?
- Are women farmers and farmers from vulnerable farmer groups equally represented in the WUA? If not, why not? What is the effect?
- What is the quality of the maintenance of the scheme? Could maintenance be improved?

3.3 Training and Extension

Training and extension are almost always an integral part of an irrigation project. It may also be that the main strategy to upgrade a scheme, or to develop and introduce appropriate and sustainable new technologies, is achieved through the technical training of involved women and men farmers and technical staff.

The Participatory Training and Extension in Farmers' Water Management (PT&E – FWM), developed by the Water Service of the Land and Water Development Division (AGLW) of FAO, is an example of the participatory planning of technological improvements and their subsequent introduction, through the training of both farmers and involved staff.

It is necessary to ensure the participation of both women farmers and the different socio-economic groups in these specific training sessions, and to ensure that the training programmes are flexible. One strategy to ensure their participation is by formulating selection criteria that explicitly describe these categories.

For example, the selection criteria discussed and agreed upon by the staff involved in the PT&E – FWM programme in Bangladesh included, amongst other criteria:

1. proportional representation of farm categories: landless, marginal (less than 0.5 acre), small (0.5 - 2.5 acres), medium (2.5 - 7.5 acres), large (more than 7.5 acres); and
2. the selection of as many women farmers (e.g. 5-10), as possible for participation, including heads of Female-Headed Households (if this proved impossible in a certain area, then only men participated). (AGLW, 2001)

The Special Programme on Food Production in Support of Food Security in Nepal (SPIN), recognises a number of reasons for the need to have women's participation in irrigation training:

- Women provide an essential input in the irrigated farming system, and have a decisive voice in the planning of the cropping and farming system.
- Women representatives will inform other women and thus a much larger group of farmers can be reached.
- If women are convinced of the benefits of the programme they will be more supportive of the SPIN activities and their participation will be increased.
- Water fee collection will be more successful if the programme is supported by women (Smith, 1995).

Both women and men farmers need to be involved in the planned extension and training programmes, including the operation and maintenance of pumps, water rotation, water management, etc. Preconceived ideas about the training needs for different groups of farmers should be avoided, and training requirements should be assessed through a "training needs assessment". Training could be organized separately for women and men, or they could jointly attend the same training sessions. The important thing is to ensure the active participation of both women and men in the training.

The location or venue of the training is also very important. Training far away from home is often less convenient for women, which can result in a lower participation rate by women compared to that of men. The PT&E – FWM programmes organize Farmer Field Schools, whereby training takes place in a field near the irrigation scheme and also close to the village. This facilitates women's participation.

The Ministry of Agriculture and Livestock Development in Malawi has provided another concrete example. It is putting a major emphasis on the establishment of on-farm demonstrations in the fields of women farmers. Experience had shown that there was a general low attendance of women farmers for training sessions or demonstrations, but that their participation increased enormously once their own fields were included in a training and demonstration programme.

It is also important to assess whether the timing of training fits in with the other activities of women farmers. The most appropriate time for meetings and training could be very early morning, or late afternoon, when women have completed most of their tasks. Again, this needs consultation with the farmers before training sessions are organized.

In addition to formal training sessions, the organization of farmer exchange visits can be a successful method of creating awareness and providing information.

In order to improve the functioning of the WUAs, and to make the women members of these associations more confident, it is possible to include a general training programme on **leadership**, covering aspects like legal status of the association, running a meeting, elementary bookkeeping and public speaking.

STAFF TRAINING

During implementation, staff training is often required in order to develop the institutional capacity needed to support the incorporation of socio-economic and gender issues into irrigation programmes. More specifically, regular staff training programmes could aim to:

- introduce the concepts of socio-economic and gender analysis;
- integrate socio-economic and gender issues into the programme and work plan with involved staff of all levels;
- monitor progress and constraints and adjust the programme to accommodate new requirements;
- introduce and familiarise staff with new facilitation skills.

Some exercises that could be used during staff training, especially to create awareness of socio-economic and gender issues, are included in **Part III** of this Guide.

LABOUR SAVING TECHNOLOGY

In general, irrigation causes an increased workload for both women and men, as well as the creation of new labour peaks. One of the ways to reduce the workload is to introduce labour saving technology for the most labour intensive tasks.

To this end, special attention should be paid to the development, demonstration and extension of technologies that save labour in planting, weeding, harvesting and post-harvest crop processing activities. Weeding especially is a very time consuming activity, and in many countries it is done by women. It should be ensured that the equipment developed and demonstrated is in line with the following criteria:

- investment costs are comparable to farmers' financial means, including access to and availability of credit;
- maintenance requirements, expenses and availability of spare parts;
- durability of the technology; and
- physical strength needed for its operation.

Key Questions for Analysis and Summary

- What are the specific training needs of women and men farmers? Do their training needs overlap?
- Are there differences in training needs across the various socio-economic categories?
- Are certain groups excluded from the training and extension activities? If so, for what reason?
- Is there a need for certain labour saving technologies? What type of technologies?

4 MONITORING AND EVALUATION

4.1 Conventional and Participatory Monitoring and Evaluation Compared

In irrigation programmes, either conventional or participatory monitoring and evaluation (M&E) methods could be used, or a combination of both. The following Table compares some features of these methods.

Conventional M&E	Participatory M&E
Outsiders are monitors and evaluators	Stakeholders themselves monitor and evaluate; outsiders facilitate
Stakeholders often don't participate	Broad range of stakeholders participate
Predetermined indicators to measure inputs and outputs are identified by outsiders	Indicators identified by stakeholders to measure the process inputs and outputs
Predetermined design	Flexible design
Focus on accountability	Focus is on learning and the empowerment of stakeholders to take corrective action and to support the planning process
Formal methods such as questionnaire surveys are used	Simple, qualitative or quantitative methods, performed by stakeholders themselves
Results are taken away from stakeholders	Results remain with stakeholders

Seeking greater participation in M&E is essentially a strategy for making decision-making a more democratic process. As greater stakeholder involvement in M&E brings together those with more and less power, and those with different or conflicting stakes, it is inevitable that not all the different perspectives will merge smoothly or can even be reconciled (Guijt et al, 1998).

4.2 Monitoring

The planning of irrigation development should include arrangements for the collection and analysis of gender-disaggregated data for monitoring and evaluation. This includes the definition of clear and gender-sensitive indicators against which to measure changes. These monitoring indicators will have been formulated during the design process (see paragraph 2.5).

Monitoring normally serves one or more of the following purposes:

- establishing progress;
- determining impacts;
- assessing accountability;
- establishing the need for measures to mitigate environmentally or socially negative impacts;
- identifying problems and constraints obstructing implementation;

- assessing need for adapting plans and additional activities, or modifying ongoing activities;
- learning and empowerment of stakeholders to take corrective action in order to support the planning process.

Regular data collection and analysis could be performed by field staff who are directly involved in the implementation of activities. As indicated above, regular staff training programmes could serve for the discussion of progress, constraints and the need for revision of plans.

Monitoring can also be carried out in a participatory way, e.g. through regular meetings or workshops with farmers, field staff, government representatives and community organizers. Topics for discussion could include: the progress of activities, constraints encountered, suggestions for adaptations in the planning, recommendations for changing certain activities, suggestions for adding certain new activities, etc. It may also include self-evaluation and monitoring methods used by women and men participants and WUAs.

☛ See tools 9, 10A and 10B in **Part II** of this guide.

In order to identify the need to adapt plans and additional activities or to modify ongoing activities, it is important to monitor the participation of women and men, and also any impact the activities have on their positions. At the same time the collection and analysis of sex -disaggregated data and participation in monitoring and evaluation meetings can increase gender awareness among the staff, and they may become more attentive to differences between women and men in their daily work.

Proper measures need to be included for monitoring changes and side effects, such as a decline in the quantity and quality of the water, as well as the planning of mitigation measures such as additional or separate drinking wells and water purification facilities.

Key Questions for Analysis and Summary

- What is the overall progress of the implementation of activities?
- Are the participants actively involved in the monitoring of progress? If yes, how? If not, why not?
- What constraints are faced in the implementation of the programme? How can these be removed?
- Do the participants investing labour and other resources actually benefit from the activities? Do all groups of farmers, women and men, equally benefit? How can differences be explained? Is there anything that can be done to distribute benefits more equally?

4.3 Evaluation

Data collected while monitoring, according to the selected monitoring indicators provides the basis for evaluation analysis. This concerns the assessment of the effects of the irrigation programme on the intended beneficiaries. These may include benefits in the medium-term, and in the case of an ex-post evaluation, carried out long after the project's completion, the full impact of the irrigation activities may be assessed. Often the impact is compared with base-line data collected before project interventions. In

order to be able to assess the gender impact of a project, it is important that those base-line data are also sex-disaggregated.

A useful participatory tool to identify the sex-disaggregated impact of activities is the Gender Analysis Matrix described in **Part II** (Tool 10B) of this guide. The tool can be used to assess the different impacts of the project on both women and men.

Implementation completion reports, impact studies and evaluation reports need to specifically identify any gender-differentiated results, and highlight the lessons learned. They should also describe and evaluate any special efforts used to increase the participation of women (Fong and Bhushan, 1996).

Evaluation of irrigation development should include an assessment of the success of the gender strategy, and its impact on the programme. Useful lessons for future irrigation programmes can be learned from strategy evaluations. These evaluations can also serve as a justification for the inclusion of gender issues in the planning and implementation of subsequent irrigation activities.

The positive impact of paying attention to gender issues is detailed in the project completion report of the Philippines Communal Irrigation Development Project. This project exceeded physical development targets and appraisal estimates of both irrigation intensity and paddy yields. The project's success has been attributed to the full participation of the farmers-beneficiaries. The project partly draws on a tradition of farmer-built irrigation systems and responds to a cultural context in which women exercise independent land rights in the community by:

- recruiting community organizers, two-thirds of whom are women;
- ensuring membership of both spouses in water user associations; and
- actively encouraging women to assume leadership roles.

It was also noted that women's membership facilitated the payment of fees, because women controlled family finances. (Quinsumbing, 1994).

An analysis could also be made of the evolution of a gender strategy, or of any changes that took place during the course of a project.

The Grameen Krishi (Agricultural) Foundation (GKF) was established in 1991 by the Grameen Bank in Bangladesh. GKF supports agricultural development through irrigation, credit and services. The Foundation's gender strategy evolved over time. At first only men were included in GKF's crop production activities, while women were supported in their traditional homestead-based activities, such as rice processing and small animal husbandry. Gradually, GKF recognised women's important and actual roles in crop production. This recognition, combined with a serious commitment to women, led GKF to shift its gender strategy to one that involves women farmers in its irrigation and agricultural activities. Agricultural production became more accessible and productive for women, who gained access to land, irrigation water, credit, seeds, fertilisers and marketing facilities. Women were also able to earn more from their agricultural activities than from traditional activities (Jordans and Zwarteven, 1997).

Key Questions for Analysis and Summary

- What is the effect of the irrigation project on the incomes (cash and kind) of both women and men from dry land? From irrigated plots? From other income-earning activities?
- What have been the benefits for women and men? What have been the adverse effects for them?
- What are the effects of irrigation on land-tenure and property ownership?
- Was the gender strategy successful? What were the constraints?
- What are the main lessons learnt?

Annex I.1: Recommended Guidelines and Manuals

AGLW. 2000. Irrigation guidelines on CD-ROM.FAO Land and Water Digital Media Series, Rome, Italy: FAO.

AGLW. 2001. Guidelines for Participatory Training and Extension in Farmers' Water Management. Rome, Italy: FAO

AGLW. 2001. Farmers' Training Manual for Participatory Training and Extension in Farmers' Water Management. Rome, Italy: FAO

AGSE. 1995, Checklist for the preparation of a feasibility study and implementation of a grain processing project, Agricultural Engineering Service, Agricultural Support Systems Division. Rome, Italy: FAO.

Chancellor, F. 1997. Developing the Skills and Participation of Women Irrigators. Oxon, UK. HR Wallingford

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Internet Resources

The following resources on the Internet can provide additional information on the use of participatory methods in rural development.

<http://www.fao.org/participation/>

<http://nt1.ids.ac.uk/eldis/pra/pra.htm>

<http://www.iied.org/>

<http://www.oac.uoguelph.ca/OAC/pdrc/resources.html>

<http://www.worldbank.org/html/edi/sourcebook/sbhome.htm>

<http://www.rec.org/REC/Publications/PPManual/cover.html>

Annex I.2: Examples of Terms of References for Socio-economic and Gender Inputs

Terms of References³

Below, three examples are provided for Terms of References for socio-economic and gender expertise in the different stages of the project: i.e. the preparation/design stage, the implementation stage and the M&E stage.

1. A Socio-economic and Gender Issues Specialist for the preparation/design stage

Overall responsibilities: The Specialist will ensure that socio-economic and gender issues are appropriately included during the project preparation/design stage. Areas of emphasis include data collection, the determination of overall project objectives and activities, and gender-sensitive project design.

Tasks:

Data Collection

The Specialist will ensure that the data collected are disaggregated by sex and by different socio-economic groups. Sufficient data should be amassed so that it can be used for appropriate project design. Data will be collected on topics such as:

- government and agency policies on gender issues;
- national level statistics on men and women, (education levels, life expectancy, infant mortality rates, etc.). National level statistics on different socio-economic groups, i.e. ethnic groups, income distribution, etc;
- a general picture of men's and women's status and role in the project area – especially in activities related to irrigated agriculture and water management – by socio-economic groups such as economic class, ethnic group, social group, etc;
- existing community and NGO groups in the project area, and the roles of both women and men in each (including women's organizations);
- previous experience with socio-economic and gender sensitive irrigated agriculture and water management projects, either in the project area or in similar areas of the country.

³ Adapted from: Gender Issues Source book for Water And Sanitation Projects, Wakeman, W. UNDP – World Bank Water and Sanitation Program, 1995, Washington: World Bank.

Project Planning/Design

Based on the collected information, the Specialist will work with community members and other project staff or team members to determine priorities and project activities. A special effort should be made to incorporate findings of socio-economic and gender analysis into the project design. In particular, the Specialist is responsible for:

- ensuring that project goals, objectives, processes and activities are socio-economic and gender sensitive and meet the needs and priorities of village women and men;
- identifying constraints on the participation of women and certain socio-economic groups, and developing strategies to minimise or eliminate them.
- making adequate staff and budget provisions for the involvement of women and certain socio-economic groups, including plans for hiring female staff (if village women do not meet with male staff);
- developing a strategy for staff training in socio-economic and gender analysis if staff have not yet been trained, and identifying community training needs; and
- ensuring that both women and men of different socio-economic groups have been involved in the choice of technology, and that it will be convenient and appropriate for their use.

2) A Socio-economic and Gender Issues Specialist for the Implementation stage

This Specialist on the project implementation team is responsible for ensuring that the socio-economic and gender sensitive project design is implemented. If the design is not sensitive to socio-economic and gender issues, the Specialist will try to modify the design during implementation. In particular, he/she is responsible for:

- developing a socio-economic and gender strategy for the project;
- hiring and supervising staff focusing on socio-economic and gender issues, and conducting training sessions for the sensitisation of other staff;
- ensuring that project activities which involve women are carried out at times and locations convenient for women of different socio-economic groups;
- organising training concerning participation and socio-economic and gender issues as needed for villagers, and specific training for women in skills needed for the project;

- working with other project staff and with villagers to develop and maintain a monitoring and evaluation system which includes socio-economic and gender-disaggregated data, and indicators concerning the involvement of both women and men;
- reformulating the project as needed during implementation, based on results of monitoring; and
- developing adequate channels of information and communication between village women and men of different socio-economic groups, project and government staff, relevant NGOs and other institutions.

3) A Socio-economic and Gender Issues Specialist for Monitoring and Evaluation

The Specialist will be responsible for developing and implementing socio-economic and gender sensitive monitoring and evaluation systems. The Specialist should be part of an overall monitoring and evaluation team, to ensure that socio-economic and gender issues are included in the overall M&E framework. In particular, the Specialist is responsible for:

- ensuring an M&E system which provides socio-economic and sex-disaggregated data and indicators used to measure the appropriateness of the project activities. The system should be designed in such a way that it provides project staff and the community with timely information which can be utilized, if necessary, to reformulate the project during implementation;
- measuring the effects of the project on women and men from different socio-economic groups;
- analysing the involvement of women and men from different socio-economic groups in the project, and their access to and control over management and resources. This includes assessing types of involvement (decision making, financial, participation in committees, management and maintenance). If there are WUAs, how many women and men are on the committees, and what roles do they play?
- examining staff attitudes towards socio-economic and gender issues and how these did or did not have an impact on project outcomes. Is the staff supportive of gender issues? Have they received socio-economic and gender training? If so, what impact did this have? Should they have received additional training or some type of on-going follow-up?
- assessing the training of the community members. What percentage of women as opposed to men was trained in each specific area, and which socio-economic groups were they from? What were the benefits of the training; what could have been done differently?

- involving village women and men in M&E data collection and analysis;
- organising meetings and workshops to inform project staff and communities of the findings; and
- delineating lessons learned and providing recommendations for future projects.

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PART II: TOOL BOX

INTRODUCTION

The following Participatory Rural Appraisal (**PRA**) tools have been included in the **SEAGA** Sector Guide on Irrigation as they facilitate the participatory planning, implementation and monitoring and evaluation (M&E) of irrigation activities. To provide some background on participatory approaches, some details of participatory attitudes and key principles of applying participatory methods and tools are presented in **Annex B1**.

Through the use of these participatory and visual tools, information can be collected (tools **1-6**), problems and options identified (tools **7-8**) and participatory monitoring and evaluation activities initiated (**9-10**).

This Tool Box is by no means intended to form a complete package for irrigation planning, but rather to indicate some methods for participatory planning of small-scale irrigation projects. The information obtained through the use of these tools may be rudimentary and preliminary, and may need to be supplemented with data from other sources and methods. For this reason some additional field methods that can complement these tools are described in **Annex B2**. This Tool Box should be used in conjunction with other **PRA** manuals and guidelines.

Most of these tools may also be useful in a training context, to create awareness of socio-economic and gender differences and their implications for the irrigation planning process. For a more detailed description of a possible training programme, see **Part III** of this Guide.

1. Resource Mapping

PURPOSE

Resource Mapping is a tool that helps us to understand better how a community works and what its resource-base is. For example, maps can be drawn of a village, an irrigation scheme, a small watershed or a swamp area. The primary concern is not with having a perfect map, but with obtaining useful information about local perceptions of resources. The mapping exercise may also serve as a preliminary analysis of the constraints and potentials of the farmers' water management situation. See also exercise 1A – Mapping Exercise of This title needs to be checked Part A of the Farmers' Training Manual – PT&E FWM.

Maps may include:

- infrastructure (roads, houses, buildings);
- water sources (wells, rivers, springs) and water use;
- agricultural land (land tenure, crop varieties and location);
- irrigation and drainage system (irrigation canals, drains, water logging, salinity);
- agro-ecological zones (soils, slopes, elevations).

PROCESS

Plan and organize a meeting for the entire community. Make sure that it is scheduled for a time when both women and men can attend, and that all socio-economic groups have been invited.

The map can either be prepared on a large open space on the ground, or on large sheets of paper. It is easiest to start by indicating a central and important landmark. Participants are then asked to draw other important landmarks on the map. Participants should not be interrupted unless they stop drawing, in which case questions can be asked, such as whether there is anything else of importance that should be added. Use the **SEAGA Questions** to deepen the discussion. When the map is completed, facilitators should ask the participants to describe it and to discuss the features represented. Ask questions about anything that is unclear. Take care that the map will be preserved for further use during the planning process in the community and that they, not you, draw the map!

ALTERNATIVES

If it is important to get an idea of changes in natural resources, older community members could draw a map of their area as it was 20 to 50 years ago. This could then be compared with a map of the present situation. The discussion could then focus on the main differences and causes for changes, e.g. deforestation, inheritance patterns and population growth. See **Figure 1A** for an example.

Next, the facilitator may want to ask participants to draw a map of how they would like to see their area in the future. This allows for some preliminary planning ideas, and encourages people to begin contributing their thoughts in the participatory planning process. **Figure 1B** is an example of how a mapping exercise resulted in a proposal for an extension of the planned irrigation scheme.

<p style="text-align: center;">Some SEAGA Questions to Ask While Facilitating</p> <p style="text-align: center;">Tool 1: Resource Mapping</p> <ul style="list-style-type: none">• What resources are in ample supply and which ones are in shortage? What resources are used? Unused? Which are degrading or improving?• Who makes decisions about who can use land? Water? Other important resources? What are the main land tenure structures?• Are the rights of access to land and water different for women and men, or for people from different ethnic or socio-economic groups?• What are the present water management practices? What is the present farming system?• Can you identify areas where there are problems with irrigation or drainage?

MATERIALS

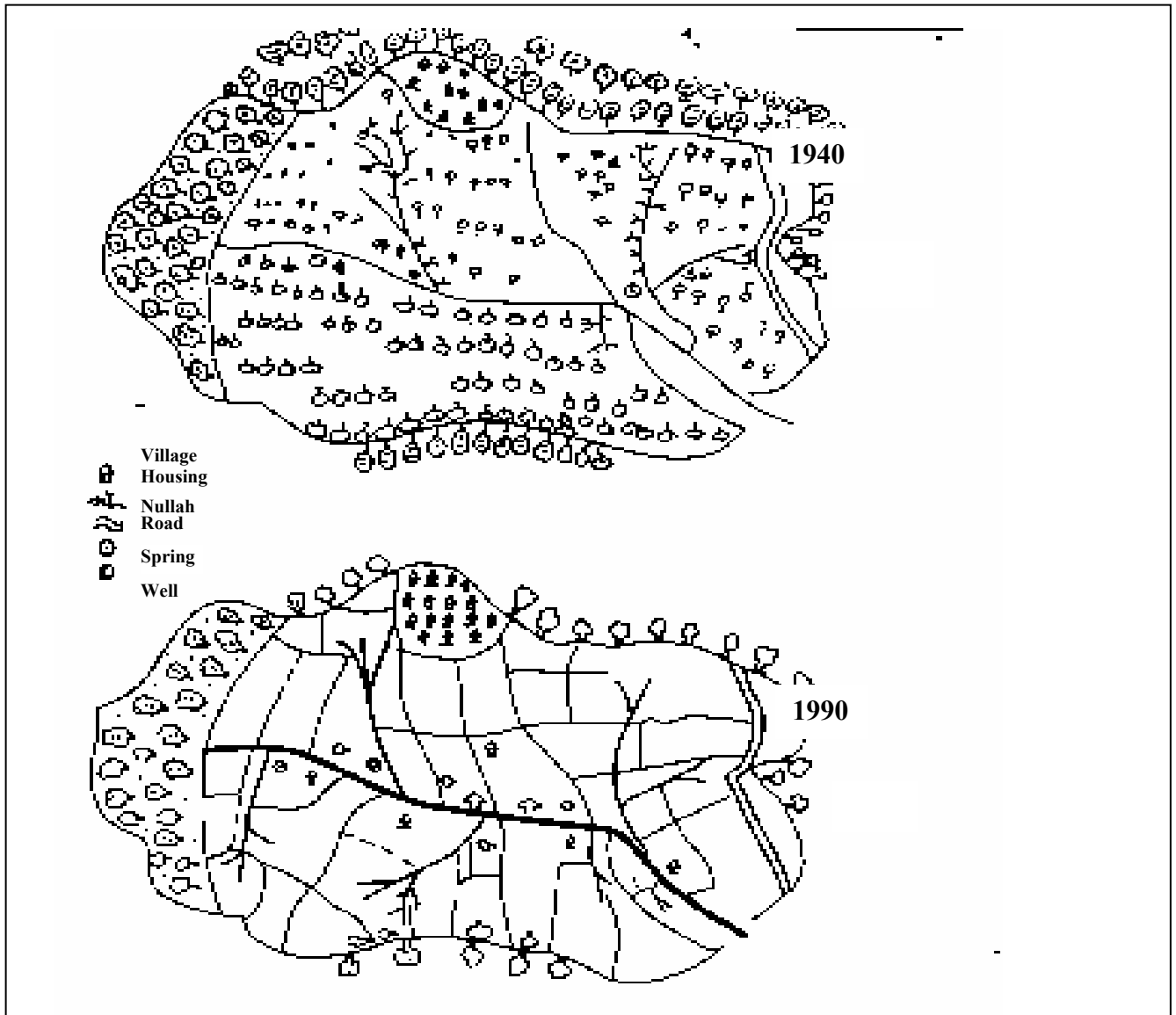
If you are working on the ground: Sticks, pebbles, leaves, sawdust, flour, or any other local material.

If are working on paper: Flip chart or large sheets of paper, coloured markers.

EXAMPLE

The historical maps produced by the people of Ardanarypura village, India, show the type and location of forest, croplands, housing, wells and springs. The maps have been drawn for a small watershed, both for 1940 and 1990.

Figure: 1 A
Tool: Small Watershed Resource Map
Example: Watershed maps, for 1940 and 1990 in Ardanarypura village, India

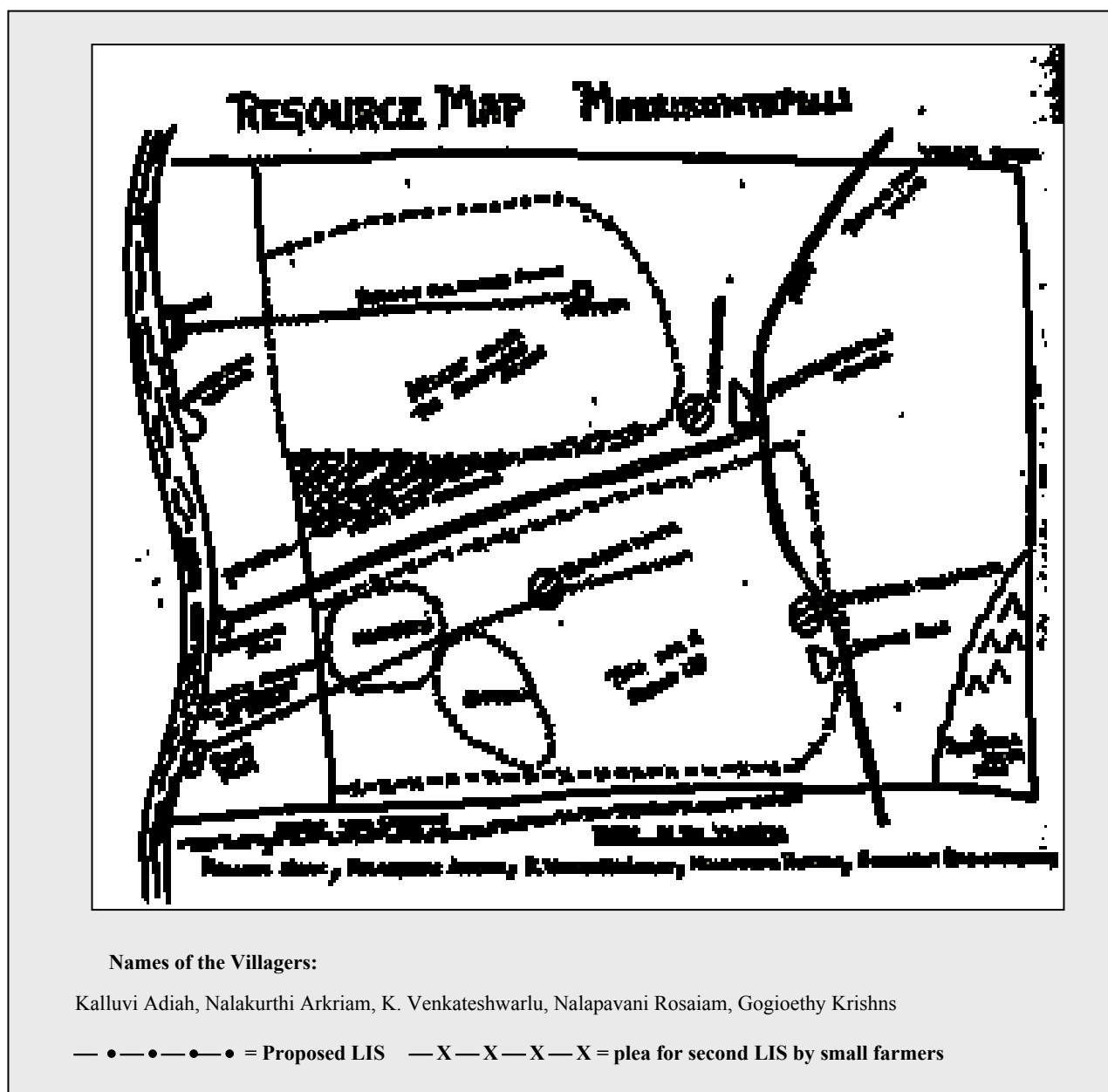


Source: Mascarenhas, J. and Prem Kumar. P.D. 1991, IIED.

EXAMPLE

The following map was drawn by a group of men. It shows existing irrigation facilities and the command area of the proposed Lift Irrigation Scheme. The group pointed out that many small and marginal farmers have their land on the other side of the village, e.g. Harijans and Chakali. They therefore are asking for a second Lift Irrigation Scheme at that side of the village.

Figure: 1 B
Tool: Village Resource Map
Example: Lift Irrigation Scheme Map of Marrikuntapalli Village, India



Source: Walsum, E.M. et al. 1993. ETC

2. Seasonal Calendar

PURPOSE

Seasonal Calendars are tools that help us to explore changes taking place over the period of a year. Calendars can be used to study many things, such as how much work people have at different times of the year, or how their incomes change in different periods. It can also be used to show the seasonality of other important aspects of livelihoods such as food and water availability.

PROCESS

Work with focus groups of women and men. This enables you to identify differences between women and men such as, for example, workload over the year.

Find a large open space for each group. Calendars can be drawn on a large piece of paper or be traced in the sand or on a dirt floor.

Draw a line all the way across the top of the cleared space or paper. Explain that the line represents a year, and ask how people divide up the year, i.e. months, seasons, etc. Ask the participants to mark the seasonal divisions along the top of the line.

It is usually easiest to start the calendar by asking about rainfall patterns. Ask the participants to put stones (or maize, sticks, leaves, etc.) under each month (or other division) of the calendar to represent the relative amounts of rainfall. More stones equal more rain, but it is useful to restrict the maximum to ten, with no stones meaning no rain.

Once the rainfall calendar is finished, participants understand the principle of making a seasonal calendar. If working on paper, remove the stones after drawing an equal number of dots in each month with a marker in order to save the result before moving on to the next calendar. Repeat this process after each calendar.

Now you can draw another line and ask participants to draw another calendar, this time showing their labour for agriculture (putting more stones over the time periods of high labour intensity). Ensure that the labour calendars, and all subsequent calendars, are perfectly aligned with the rainfall calendar.

This process is repeated, one calendar under another, until all the seasonal issues of interest are covered. Ensure that calendars include aspects related to food availability, water availability, income sources and expenditures. Ask the participants to put a symbol or sign next to each calendar to indicate the topic. As far as possible, ask them to also describe the sources of food and income, etc. Preparation of a seasonal calendar often leads to lively discussions among participants. Use the following questions to facilitate the discussion.

Some SEAGA Questions to Ask While Facilitating

Tool 2: Seasonal Calendars

- How do women's calendars compare with men's? What are the busiest periods for women? For men? Are there daily, seasonal or yearly labour peaks and shortages?
- How does food availability vary over the year? Are there periods of hunger?
- How does income vary over the year? Are there periods of no income?
- What are the key linkages among the different calendars? E.g. water availability and food supply, rainfall and labour or food availability and disease occurrence.

The seasonal calendar can also be used as a tool to explore the main cropping seasons and cropping pattern. For this purpose, indicate for each crop when it is sown, which months the crop is in the field, and when it is harvested. See also exercise 1C of Part A of Farmers' Training Manual PT&E on FWM.

MATERIALS

Sticks, pebbles, maize, leaves or any other local materials may be used, or paper and markers.

EXAMPLE

Groups of women and men produced their own seasonal calendars during **PRA** exercises held in Vietnam. This example illustrates how Seasonal Calendars can be used to look at linkages among several different patterns: rainfall, agricultural labour, food availability, water availability and human diseases. The original calendar was prepared following the lunar calendar, and the data were later transferred to a Roman calendar.

Figure: 2A
Tool: Seasonal Calendar

Example: Seasonal Calendar prepared by women for Xuan Truong Commune, Vietnam

	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec
Rainfall		*	**	**	***	****	*****	****	*	*	*	*
Agricultural labour	*	**	***	***** *	***** **	****	***	**	***** *	*****	**	****
Off-farm labour	*	*	*	*	*	*	*	*	*	*	*	*
Food Availability	*** *	***	*				**	**	***** *	*****	*****	****
Water Availability	*	*	**	***	*****	*****	*****	*****	*	*	*	*
Human diseases	*	*	*			***	***					
Animal diseases	***	***	*	*	***	***	***	*	*	*	***	***

(Each star represents a kernel of maize)

This example indicates the following seasonal variations and inter-linkages:

- there are two agricultural labour peaks: April/May for land preparation, planting of maize and transplanting of rice and September/October for harvesting rice and maize;
- food shortages occur from March to July, when some maize is harvested to relieve food shortage;
- water scarcity occurs from September to February, and is most severe in the months of November, December and January;
- a peak in human diseases, mostly flu, occurs in June and July with reduced resistance caused by months of food shortages coinciding with an agricultural labour peak;
- animal diseases show two peaks: women reported that in May-July a lot of ducks die of epidemics, and in November and December cows and buffaloes die from anthrax and cold.

The seasonal calendar prepared by men did not significantly differ from the one prepared by women. Men were often away in the months from October to December, cutting wood in the forest. Men did not mention the ducks' diseases since mostly women took care of the ducks, and men did not know these details.

Source: Jordans. 1999. Vietnam.

3. Task Analysis by Gender

PURPOSE

To collect information, raise awareness and understand how household tasks are distributed according to gender.

PROCESS

The analysis of the distribution of tasks can be done through the conduction of semi-structured interviews with a number of households. The exact number of households will depend on the time available, but a minimum of 10 needs to be included. Make sure you consider households from different socio-economic and ethnic groups, households with different livelihoods, female and male-headed households, etc.

Preparation: On the basis of existing information, e.g. the seasonal calendar, define what is the main cropping pattern. Prepare a checklist of issues, including tables on the different tasks in the main production areas, e.g. lowland cultivation, upland cultivation, animal husbandry and other activities. For example, a table could look like this:

Lowland cultivation	Household labour (%)			Hired labour (%)		Task not done	Total
	Male	Female	Children	Male	Female		
Activity							
1. Selecting seed							100
2. Making seedbed							100
3. Other activities							
Total							100

Some people prefer to have detailed checklists so that they do not forget what they want to ask, while others feel more comfortable with only a broad outline. Questions related to the socio-economic condition of the household, in terms of family composition, resources, e.g. land, and sources of income, should be included. This is important in order to relate the findings on the gender division of labour to the socio-economic position of the households.

Household Interviews: Conduct interviews with individual farmers or households, for example in their houses, the fields, a market, etc. Try to conduct the interviews in as relaxed and friendly a manner as possible. Start by explaining the purpose of the

interview. How the questions are asked will also depend upon what the participants have to say. This allows the conversation to be more natural and free flowing. It also gives the persons being interviewed the opportunity to bring up new issues not anticipated by the interviewer.

Ask specific details on sex-disaggregated labour patterns with a view to understanding how the different members in a household share the labour for each task. A specific question could be: “Regarding the irrigation of rice, who in your family does most of the work and who helps?” A possible answer could be that the woman says that she does most of the irrigation tasks, because her husband is away working somewhere else during the day, and that her son helps her. This could be represented in the above table as: 75% of work being done by women and 25% by children.

Alternatively, ask whether specific tasks are done by women, men or by both women and men. **Figure 3 A** is an example of the outcome of interviews using these types of specific questions.

Make notes of any additional information and details that people provide during the interviews.

Compile all data afterwards, and try to distinguish a general pattern. For example, it may be that in female-headed households, women and male children do most of the fieldwork. Collect data on specific tasks and try to distinguish in general who does what. For example, the finding could be that women do 80% of the task of seed selection, whereas the marketing of the products is done entirely by men.

If possible, discuss these findings in a group meeting using the following questions. This would also help to validate the results.

Some SEAGA Questions to Ask While Facilitating

Tool 3: Task Analysis by Gender

- What is the actual involvement of women and men in rain fed and irrigated crop production?
- Are there any changes in the gender division of labour compared with what their mothers and fathers used to do? What caused these changes?
- Considering the gender division of labour, who should be involved in irrigation planning activities?
- How does the task distribution in female-headed households differ from the division of labour in male-headed households?

MATERIALS

Checklists, paper and pens or pencils.

EXAMPLE

Figure 3 A
Tool: Task Analysis by Gender
Example: Division of Tasks in Rice Production in Northwest Bangladesh
(Households owning between 0 to 0.5 acre of land)

Activity	Household labour (%)			Hired labour (%)		Task not done	Total
	Male	Female	Children	Male	Female		
1. Selecting seed	41	59	-	-	-		100
2. Making seedbed	50	36	-	5	-	9	100
3. Uprooting seedlings	27	68	5	-	-		100
4. Land preparation	52	7	-	41	-		100
5. Transplanting	34	43	9	14	-		100
6. Fertilising	59	27	5	9	-		100
7. Spraying	27	-	-	9	-	64	100
8. Irrigating	32	54	9	5	-		100
9. Weeding	14	61	18	-	7		100
10. Harvesting	27	48	7	18	-		100
11. Threshing	20	77	-	3	-		100
12. Winnowing	-	100	-	-	-		100
13. Cleaning/ Drying	-	100	-	-	-		100
14. Processing	-	95	-	-	5		100
15. Marketing	54	41	-	5	-		100
16. Storing		100					100
Total	27.3	57.2	2.7	8.0	0.8	4.0	100

N = 11: from the 11 households interviewed 7 were female-headed

Source: Jordans and Zwarteveen. 1997. IIMI: Sri Lanka.

EXAMPLE

Below is a compiled table of the gender division of tasks as perceived by villagers in 38 households in Purbi Shankar Nagar, Nepal (W = Women, M = Men, B = Both).

Figure: 3 B
Tool: Task Analysis by Gender
Example: Division of tasks in Purbi Shankar Nagar, Nepal

Activities		W	B	M	Activities		W	B	M
Rice	Preparing seeds	*			Lentil	Broadcasting			*
	Preparing seedbed			*		Harvesting	*		
	Sowing			*		Threshing			*
	Ploughing			*		Storing	*		
	Levelling			*	Mustard	Broadcasting			*
	Preparing food	*				Transporting manure	*		
	Transplanting	*				Applying manure			*
	Weeding	*				Irrigating			*
	Irrigating		*			Harvesting			*
	Harvesting	*				Threshing			*
	Bundling	*			Storing	*			
	Transporting			*	Livestock	Milking			*
	Threshing			*		Cleaning shed	*		
	Storing straw			*		Watering			*
	Storing grain		*			Feeding			*
Manual winnowing			*	Cutting grass		*			
Fan winnowing	*			Herding				*	
Wheat	Ploughing			*	Other	Collecting fuel	*		
	Levelling			*		Cooking	*		
	Sowing			*		Cleaning	*		
	Irrigating			*		Child caring	*		
	Fertilizing		*			Kitchen gardening	*		
	Harvesting		*			Maintaining irrigation			*
	Threshing	*							
	Cleaning	*							
	Storing	*							
Maize	Transporting	*							
	Manure								
	Applying manure		*						
	Ploughing			*					
	Levelling			*					
	Broadcasting			*					
	Line sowing	*							
	Weeding	*							
	Harvesting	*							
	Removing kernels		*						
Storing		*							

Source: Zwarteveen, M. and Neupane, N. 1995.

EXAMPLE

In the Fayoum Water Management Project II in Egypt, the tool for assessing gender division of labour was used with a group of women. To overcome high illiteracy and existing norms that perceived irrigation as a male task, pictures were drawn of the most common household tasks done by women supplemented with some irrigation and agricultural related tasks. The tool allowed the participants and facilitators to get a better insight into the participation of women in irrigation related activities, and the recognition of women's involvement in irrigation.

During the group discussion women identified which tasks they carry out on a daily basis. The result was that the women did not seem to have problems in identifying themselves with the women on the drawings carrying out the activities. Two-thirds of the women indicated that they are involved in irrigation tasks. This figure was much higher than if the women had been asked directly whether or not they were involved in irrigation.

Source: M.W.L.H. Langeveld, Personal Communication

4. Access to and use of resources

PURPOSE

The access to and use of resources by both men and women can be made visually clear using Resource Picture Cards.

PROCESS

Place the three large drawings, one of a man, one of a woman and one of a man and woman together on the ground in a row with adequate space between them. (Alternatively they can be taped up on a wall.) Underneath these drawings scatter at random the smaller cards, each depicting a different resource. Include some blank cards so that participants can add resources. Resources such as irrigated land, rain fed land, capital, credit, livestock, poultry, knowledge/information, means of transport, water pump, watering can, and etc. can be included in the exercise

Ask participants to sort the cards by placing them under the three large drawings, depending on who **uses** the resource, whether women, men or both. Facilitate the discussion among the participants about why they made the choices they did.

Then put the second set of drawings and cards on the ground close to the first set. Repeat the exercise, but this time focus on who has **control, ownership or decision-making power** concerning each resource. Again, facilitate the discussion among the participants about why they made the choices they did.

N.B. Specify that only the resources used or controlled 50-50% by women and men are put under the drawing of both; otherwise they should put the pictures nearer to the woman or the man to indicate who has more use or control.

Ask participants to compare the way they have arranged the two sets of Resources Picture Cards.

MATERIALS

Two sets of large drawings of a man, a woman and a couple. Two sets of Resources Picture Cards. Small stones to hold the cards in place if the exercise is performed outside, or masking tape if using a wall.

Some Resource Picture Cards are included in this Tool Box, although additional cards would need to be drawn in order to be relevant to a given situation. Another alternative is to have the community members draw up the resource picture cards themselves, so that they are really relevant to their situation.

Some SEAGA Questions to Ask While Facilitating

Tool 4: Access to and use of resources

- Which resources do men use? Which resources do women use? Which resources do they both use?
- Is it women, men or both who use the resources of high value? E.g. irrigable land, irrigation technology. Is it women, men or both who make the decisions about high value resources?
- Which resources do women have control over? Which resources do men have control over? Which resources do women and men both have control over?
- What are the linkages between women's labour and their use and control of resources? What are the linkages between men's labour and their use and control of resources?
- Is it women, or men, or both who uses credit? Who makes the decisions on credit use? What are the experiences with credit?
- What is the resource use and decision-making pattern in female-headed households?

EXAMPLE

In the Fayoum Water Management Project II in Egypt rural women indicated that both women and men have access to most resources, although control of the resources was perceived to be only in the hands of men.

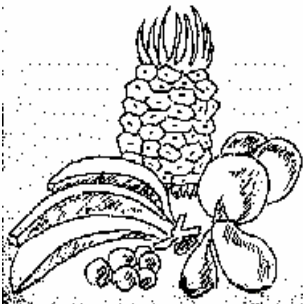
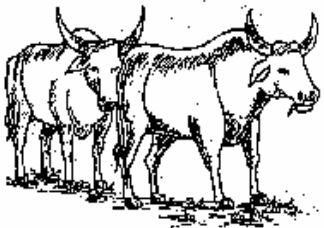
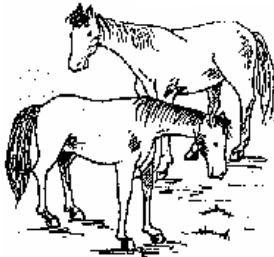
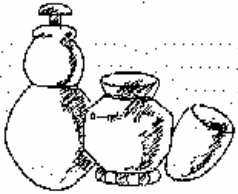
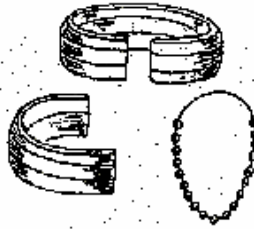
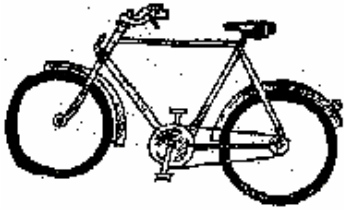
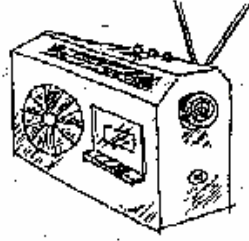
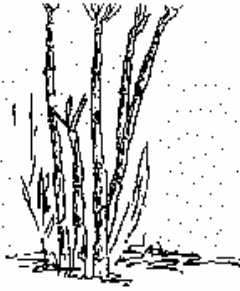
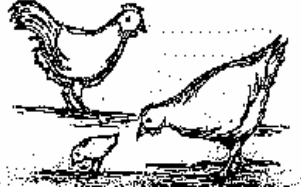
In this situation the tool functioned also as a method of raising awareness, although it was recognised that there is a danger in making people aware of an existing imbalance in that men may feel negatively portrayed, and women may voice their dissatisfaction. This should be considered when deciding whether to use out the tool. It is important that this tool is not used purely for information gathering, but that some activities and support are provided in order to address some of these socio-cultural issues in an appropriate manner.

Source: M.W.L.H. Langeveld, Personal Communication

CARDS

On the next pages a number of Resource Picture Cards are presented that can be used for this tool. Additional cards must be drawn locally, and all people should have a similar understanding of what each resource card depicts. An alternative is to use pictures of resources that are used in the area. Two sets of these pictures should be prepared beforehand for use with this tool.





5. Venn Diagram

PURPOSE

The Venn diagram is a tool that helps us understand the importance of local groups and institutions, and people's access to them. This can be useful for clarifying decision-making roles and identifying potential conflicts between different socio-economic groups. It is also helpful for identifying linkages between local institutions and those at the **intermediate** and **macro** levels. In the context of irrigation this is a tool to provide an insight into the importance of, and access to, Water Users' Associations for different socio-economic groups and for both women and men.

PROCESS

Organize separate focus groups of women and men, including a mix of socio-economic groups. Ensure that the poorest and most disadvantage, (by ethnicity or caste etc.) are included, or where appropriate have their own groups.

The Venn diagram can be traced on the ground, but coloured circles on a large sheet of flip chart paper can also be used. It is helpful to cut out circles or squares in different sizes and colours ahead of time.

Start by asking the participants to list the local groups and organizations, as well as the outside institutions that are most important to them. Then, ask them to decide whether each organization deserves a small, medium or large circle (to represent its relative importance). The name (or symbol) of each organization should be indicated on each circle or square. Make sure each organization has a different colour, if possible. Next, the position of the circle or square can illustrate the level of access to the institutions. A large distance means little access, a short distance good access.

Analyse as many institutions as possible, and ask the participants to position them in relation to themselves. There may be a lot of debate and repositioning of the circles until a final consensus is reached.

In general it is important to understand in what ways the different participants are satisfied or dissatisfied with the groups or institutions available to them. It is also important to establish whether certain kinds of people, (e.g. women, the poor, or people from a certain ethnic group) are excluded from participation in certain institutions. Use the **SEAGA** Questions below to deepen the discussions.

Finally, be sure to analyse and compare the Venn Diagrams produced by the different groups of participants. If one group has given a certain institution a large circle and another has given it a small circle, find out why. How is that institution relating differently to various members of the village? Note also whether one group has included fewer organizations in its diagram.

MATERIALS

Flip chart paper, markers, sticky paper (in several colours) and scissors.

Some SEAGA Questions to Ask While Facilitating

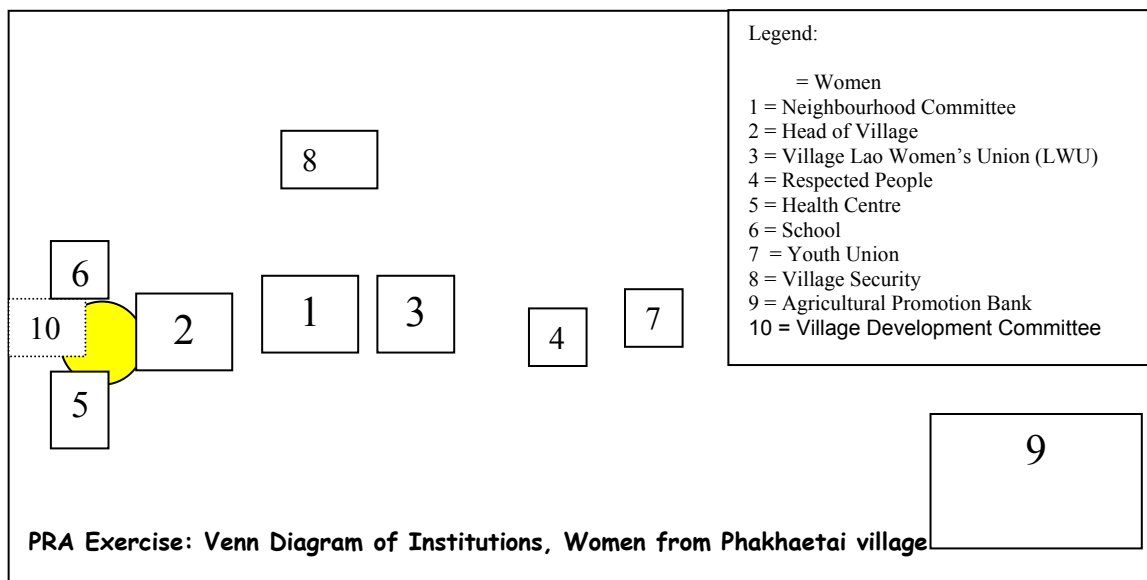
Tool 5: Venn Diagrams

- Are there local groups organized around environmental issues? E.g. forest users group, water users group.
- Are there local groups organized around economic issues? E.g. credit, agriculture production.
- Are there local groups organized around social issues? E.g. health, literacy, religion.
- Are there groups from which women are excluded? Which ones? Why? What do they lose due to their lack of participation?
- Are there groups exclusively for women? If so, what is the focus of these groups? What do women gain from them?
- Are the poor excluded from any of the local groups? Which ones? Why? What do they lose due to their lack of participation?
- What are the links between local groups or organizations and outside institutions? E.g. NGOs, political parties, government institutions.

EXAMPLE

The result of a Venn diagram exercise with a group of women in Phakhaetai village is presented below.

Figure: 5
Tool: Venn Diagram of Institutions
Example: Women from Phakhaetai village, Lao PDR



The above diagram illustrates the following institutional issues:

- the need for an increased access to credit. The women characterised the Agricultural Promotion Bank (9, APB) as being difficult to access, but of great importance to them (large distance, big square).
- the absence of Agricultural Extension in the diagram illustrates women's lack of access to extension services;
- the importance of, and close relationships with the Village Head (2), Lao Women's Union (3, LWU) and Neighbourhood Committee (1);
- the important role of schools and health centres constructed by the Project was explained as follows "without education and if you are sick, you cannot do anything";
- the Village Development Committee (10, VDC) was added after discussion with the men's group. The VDC had just been formed and was not yet very active, and women were not sure whether it would be useful to them.

The main difference between this diagram and that prepared by the group of men was that the men included organizations and institutions of strategic interest to them and mostly outside the village, such as the VDC, the Project, district administration, provincial administration and the APB. Men included the agricultural extension service as being quite easy to access, but of no great importance to them.

Source: Jordans. 2000. Lao PDR

6. Water Use Matrix

PURPOSE

To help community members analyse their situation with regard to various water sources and different uses of water, and to help plan changes in water uses, e.g. introduction of irrigation.

PROCESS

Work with one group of women and another group of men. Begin by asking the group to list their main sources of water. Start by having them draw the matrix on the ground, or on a large piece of paper, indicating each source of water across the vertical axis. The group may want to select pictures or symbols to represent each water source. If all participants are literate, they can also write the names down.

Ask the group to list their main uses of water. Place the different water uses, represented by pictures or symbols, across the horizontal axis.

Invite the participants to distribute stones (or leaves, maize, etc) in the matrix to indicate from which water source they draw water for each water use: more stones equal a higher importance for that particular use (use a maximum of ten stones).

In a plenary session, discuss and compare the matrices of both the women and men's groups. Analyse the importance of the different water sources, and differences between women and men regarding their use of water.

Alternatives:

- The Water Use Matrix can be filled out twice. Once for the rainy season and once for the dry season.
- Similarly, the water use matrix can be completed by a group of poor women and by a group of rich women, by poor men and by rich men.

Some SEAGA Questions to Ask While Facilitating

Tool 6: Water Use Matrix

- What are the major water use constraints for women? For men? What are the main causes? How could these constraints be overcome?
- Is the quality and reliability of each water source important? If yes, why?
- What are the differences between the water use matrices prepared by women and by men? Between poor and rich people?
- Is lack of water a limiting constraint in the farming system? How will the planned irrigation activity affect water uses?
- How much can people afford to pay for water? For what uses do/will they pay?
- Do all socio-economic groups have equal access to water? Which groups have a constrained access? How could their access to water be improved?

MATERIALS

Flip charts or large sheets of paper, markers. stones, leaves, maize, etc.

EXAMPLE

The following examples present information provided by a group of women on the different water sources and water uses in the Kim Lu commune in Na Ri District, Bac Can Province, Vietnam. Since all participants were literate, the water sources and uses were written down.

Figure: 6 A
Tool: Water Use Matrix

Example: Water Sources and Use in Rainy Season in Kim Lu Commune, Vietnam

	Watering Animals	Washing	Drinking	Cooking	Watering fields
River	8	3	2	2	1
Stream	7	3	2	2	1
Spring	6	8	3	2	1
Pond	8	10	2	2	2
Rainfall	9	7	10	10	10
Well	3	2	9	9	0

The matrix was filled up again, but this time the situation in the dry season was depicted.

Figure: 6 B
 Tool: Water Use Matrix
 Example: Water Sources and Use in Dry Season in Kim Lu Commune, Vietnam

	Watering Animals	Washing	Drinking	Cooking	Watering fields
River	10	9	8	8	8
Stream	10	8	8	10	10
Spring	6	6	8	8	6
Pond	-	-	-	-	-
Rainfall	-	-	-	-	-
Well	-	-	2	2	-

From the matrix in figure 6A, it can be concluded that during the rainy season, rainfall is the most intensively used water source for all water uses. The women said “We try to store rain water as much as possible in everything that can contain water”. During the dry season the only water sources available are the springs, streams and rivers, all located at a distance of 2 kilometres or more from the hamlet. In some hamlets water shortage is acute as there is no water available. Women are mainly responsible for water collection, and in the dry months they have to travel long distances to collect domestic water. Apart from the distance, these water sources tend to be dirty during the dry season.

Water-borne diseases, like diarrhoea, commonly occur during the months of May till August. This seems contradictory, since during these months a lot of water is available. However, except for springs and rainfall, the water sources are not very clean. The incidence of diarrhoea is also caused by the lack of food during these months and consequent malnutrition at the peak of the agricultural season (this was a finding from the seasonal calendar).

It was interesting to note that before using the Water Use Matrix, household interviews were conducted and none of the interviewees mentioned the existence of irrigation, or watering of crops. This information only came out during the matrix exercise. Therefore it served as a way of crosschecking and validating information.

Source: Jordans. 1999. Vietnam.

7. Problem Ranking and Problem Analysis Chart

PURPOSE

The different problems are presented and discussed with the community as a whole, showing where the constraints of various people overlap and where they differ. This also allows for an expanded discussion of the *causes of the problems*, as well as current *coping strategies*. These may be strategies that can be built upon for improvement. We can also understand if efforts to address a particular problem have already been made and have failed, or have not completely addressed the problem.

The Problem Analysis Chart also looks at *opportunities* for development. For this reason it is important that technical "experts" from outside agencies and organizations, such as irrigation engineers, extension officers and NGO workers, are also invited to participate. While local people may have very good ideas about what they need, they may lack information about the options that irrigation development can offer.

PROCESS

Problem Ranking

Organize two separate groups, one of women and another of men. Make sure that a mix of socio-economic groups is included in each. Ask participants to think about their problems, especially in relation to water management. During the discussion, ask them to list the six problems that are most important to them.

Rank the problems according to importance. Stones could be used, more stones equalling more importance. Select the three main problems. Discuss the causes and effects of these problems.

If applicable, organize a second set of groups – this time according to socio-economic group. Make sure that both women and men are present in each group. Repeat the exercise.

Problem Analysis Chart

Plan and organize a meeting for the entire community. Make sure that it is scheduled for a time when both women and men can attend, and include a mix of socio-economic groups. Beforehand, you must also invite at least two or three technical experts from outside agencies and organizations who either know or have been briefed on the participatory approach being used.

The plenary meeting should begin with a presentation of the priority problems (and their causes and effects) of women and men, and of the different socio-economic groups. This provides the entire community and the outsiders with a complete overview of the situation.

Prepare the Problem Analysis Chart by listing the priority problems identified by each of the different groups in the far left column. Where more than one group has identified a problem, list the problem only once. In the second column, list the causes of the problems as identified by participants. Present the Problem Analysis Chart to the entire meeting.

Then ask people to explain what they currently do to cope with their problems. List the coping strategies in the third column. Finally, with specific reference to each problem, discuss opportunities for improvement asking both the local community members and outside experts to contribute their ideas. List the solutions in the fourth column. It is also possible to add a fifth column that describes specific gender issues related to each problem, cause, coping strategy and opportunity.

Some SEAGA Questions to Ask While Facilitating

Tool 7: Problem Ranking and Problem Analysis

- What problems identified are a priority for women? For men? Which problems are the same for everyone?
- What are the different problems identified by the different socio-economic groups? Which priority problems did different groups share? Which priority problems are related?
- Who are the stakeholders having a stake in the planned irrigation development? How big is their stake?
- Are there conflicts among stakeholders? Are there existing partnerships between stakeholders?
- Did the outside experts identify additional causes of the problems? What are they?
- What are the current coping strategies? What are the gender implications? e.g. women have to walk further and further to fetch water in the dry season.
- What are the opportunities to solve the problems? What opportunities did community members suggest? By the technical experts? Which can be implemented locally? Which require external assistance?

This tool is especially useful in the planning of rehabilitation or upgrading of existing irrigation schemes. A similar process to that described above should be followed. The discussion should focus on an analysis of problems concerning the irrigation scheme, the present coping strategies and the opportunities for improvement. For more details see also Exercise 1B – Ballot box/Transect Walk and Exercise 1D – Problem identification of Part A of the Farmers’ Training Manual PT&E FWM.

Some SEAGA Questions to Ask While Facilitating

- What are the technical constraints faced by women farmers? By men farmers? What are the opportunities for technical improvement of the irrigation scheme (at the on-farm and system levels)?
- What are the organizational constraints faced by women farmers? By men farmers? What are the opportunities for organizational improvement of the irrigation scheme (at the tertiary and system level)?
- Do all farmers receive enough water for irrigated production? If not, which groups of farmers do not receive enough water? Why? How could this be remedied?
- What are the arrangements for Operation and Maintenance? Do these work? If not, why? How should these arrangements be changed?

MATERIALS

Flip chart paper, easels or walls or fences to hang up the maps, diagrams and charts, masking tape or tacks, markers and a prepared Problem Analysis Chart.

EXAMPLE

The problem analysis chart produced by the people of Uttor Maria village in Kishoreganj Thana, Bangladesh shows three important problems and their causes, current coping strategies and development opportunities for each. The first problem was identified by both men and women, the second identified by women from the village, and the last problem by men.

Figure: 7
 Tool: Problem Analysis Chart
 Example: Problem Analysis Chart from Uttor Maria Village,
 Kishoreganj Thana, Bangladesh

Problem	Causes	Coping Strategies	Opportunities
Poverty / Food insecurity	<ul style="list-style-type: none"> • Landlessness • Small acreage land • Lack of off-farm employment 	<ul style="list-style-type: none"> • Refrain from taking nutritious and costly food • Take loans from moneylender • Receive food aid 	<ul style="list-style-type: none"> • Creation of job opportunities • Savings and credit schemes • Intensification of homestead and field production (irrigation) • More food aid
Large family size	<ul style="list-style-type: none"> • Lack of awareness • Lack of family planning methods 	<ul style="list-style-type: none"> • Try to reduce family size • Economise family budget, save on education, clothing and ceremonies 	<ul style="list-style-type: none"> • Use family planning methods • Get married later • Eliminate illiteracy
Lack of capital and inputs, such as irrigation water and fertiliser	<ul style="list-style-type: none"> • Poverty • Lack of credit sources • Non-availability of inputs 	<ul style="list-style-type: none"> • Use own seeds • Leave land fallow • Reduced use of fertilisers and water 	<ul style="list-style-type: none"> • Access to credit to buy fertilizers and irrigation pumps • Seed multiplication at local level • Training on low external input agriculture

Source: UNDP/FAO, TSS-1 on Household Food Security, April 1997

8. Options Assessment

PURPOSE

The Options Assessment Chart is a tool that helps us to make choices between different options, resulting in concrete and realistic plans for implementation.

PROCESS

Organize a community meeting with people who share a development priority: e.g., rehabilitation of an irrigation scheme or increase of water availability. Make sure both men and women are represented, as well as different socio-economic groups. Explain that the purpose of the Options Assessment Chart is to select the best development option, and start planning its implementation.

Begin with listing the opportunities and solutions, as identified in the Problem Analysis Chart, in the first column. Then discuss and reach consensus on the impact (negative, no impact, positive, very positive, unknown) of each solution on:

- productivity
- stability
- sustainability
- equitability

Then assess the time period before a solution will be implemented (long, medium, short), the cost (high, medium, low), and the feasibility (low, medium, high).

On the basis of the chart discuss the “Best Bet”.

See also Exercise 1E – Identification of solutions and appropriate technologies of Part A of Farmers’ Training Manual PT&E FWM.

Some SEAGA Questions to Ask While Facilitating

Tool 8: Option Assessment

- Are certain options more favourable to women? To men? To certain socio-economic groups?
- Does the option chosen, the “best bet”, address constraints identified by women? By men? By all socio-economic groups? If not, why?
- Will there be losers and winners? Who will benefit? Who will not benefit?
- Can the solution chosen be implemented locally? What external assistance is required?
- What are the necessary investments, organizational and technical capacity to implement the “Best Bet”?

MATERIALS

Flip chart paper, an easel or wall, masking tape, and markers.

EXAMPLE

Figure: 8
Tool: Options Assessment Chart
Example: Options to increase water availability, Mbusyani Village, Kenya

Mbusyani Options Assessment Chart

BEST BET OR INNOVATION	PRODUCTIVITY	STABILITY	SUSTAIN - ABILITY	EQUITABILITY	TIME TO BENEFIT	COST	TECHNICAL and SOCIAL FEASIBILITY
BOREHOLES	?	0	-	0	3	3	3
ROOF CATCHMENT	+	+	++	+	1	1	2
NATURAL SPRINGS	+	+	+	++	1	2	2
REHABILITATE DAMS	++	+	++	++	1	2	2
SHALLOW WELLS	+	+	++	0	2	1	2
NEW SURFACE DAMS	++	+	++	++	1	2	2

KEY

?	UNKNOWN
-	NEGATIVE IMPACT
0	NO IMPACT
+	POSITIVE IMPACT
++	VERY POSITIVE IMPACT

	TIME	COST	FEASIBILITY
3	LONG	HIGH	LOW
2	MEDIUM	MEDIUM	MEDIUM
1	SHORT	LOW	HIGH

Source: Participatory Rural Appraisal Handbook. 1992

9. Water Group Functioning - The Three Star Game

PURPOSE

To enable Water Users' Associations (WUAs) to rate their overall performance and to evaluate the contribution of key people and activities to the functioning of the group.

PROCESS

Place each of the three stars on the ground in descending order of size. Explain to the water users' group that, depending on the context, the stars represent excellent, average, poor or very important, important, not important.

Then display the cards depicting water group functions and key people associated. Explain the pictures. Ask the participants to discuss the effectiveness of each person or activity in their own group.

Afterwards, ask the group to place each of the pictures underneath the appropriate size star to rate its functioning. Once consensus is reached, ask the group to explain and discuss its ratings. The group is then asked to give an overall rating.

Encourage the discussion to focus on follow-up planning to take corrective action where needed.

Some SEAGA Questions to Ask While Facilitating

Tool 9: Water Users' Group Functioning

- Who is paying water and maintenance fees? Who is not paying? What is the general payment rate?
- Are women equally represented and involved in the group functioning (membership, meetings, management tasks)? Are men? Are certain socio-economic groups? If not, why?
- How could the participation of women and certain socio-economic groups be increased?
- What are the problems in the co-operation between the water users' group and the irrigation agency, the field worker, the bank? What are the supports?

MATERIALS

Three stars, big, medium and small. A number of cards depicting water group functions and key people associated with water users' groups, such as:

- group co-operation
- sanctions
- angry group members/conflict
- extension worker/irrigation engineer

- fee collection
- planning and design
- maintenance work

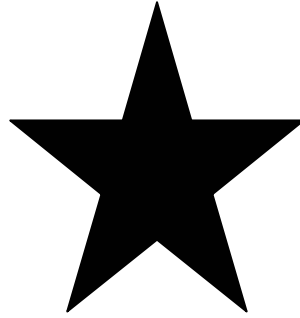
See Module 5 of Part B of Farmers' Training Manual PT&E FWM for more details on the formation of Water Users' Associations, including the definition of responsibilities and conflict resolution practices.

CARDS

Included are some pictures and cards to implement this tool. Additional drawings would need to be produced if required. Make sure the drawings and pictures are culturally appropriate. Alternatively, real life pictures of the Water User Association and its main activities could be made and printed for use in this tool.



Angry group members' conflict



Chair of water group



Group meeting and discussion



Water fee payment and collection



Group co-operation



Maintenance of water pump



10. Participatory Monitoring and Evaluation

Conventional and Participatory Monitoring and Evaluation Approaches are compared in the Table below:

Conventional M&E	Participatory M&E
Outsiders are monitors and evaluators	Stakeholders themselves monitor and evaluate: outsiders facilitate
Stakeholders often don't participate	Broad range of stakeholders participate
Predetermined indicators, to measure inputs and outputs are identified by outsiders	Indicators identified by stakeholders; to measure the process inputs and outputs
Predetermined design	Flexible design
Focus on accountability	Focus is on learning and the empowerment of stakeholders to take corrective action and to support planning process
Formal methods such as questionnaire surveys are used	Simple, qualitative or quantitative methods, performed by stakeholders themselves
Results are taken away from stakeholders	Results remain with stakeholders

As is indicated in the above Table, a range of simple, qualitative or quantitative methods can be used for participatory monitoring and evaluation. Some tools are described below.

10 A. Participatory Monitoring

PURPOSE

To monitor progress whereby local people are active participants and the process builds commitment to implement any recommended corrective action.

PROCESS

Participatory approaches to monitoring can take many forms and can involve different levels of participation. Methodologies can include stakeholder workshops, participatory assessments and regular data collection by the participants themselves.

This could start with the definition of indicators that measure change or results brought about by an activity or by an output from an activity. It is often better to define these indicators at the time of activity planning.



It is important that a consensus is reached within the group on the selection of indicators so that everyone is monitoring the same thing with the same standards.

Also a regular interval needs to be decided upon for monitoring the activities, whether in monthly group meetings or weekly data collection efforts.

<p>Some SEAGA Questions to Ask While Facilitating</p> <p>Tool 10 A: Participatory Monitoring</p> <ul style="list-style-type: none"> • Is it possible to disaggregate the indicators by socio-economic group? By gender? If so how? If not, why? • What process indicators can be formulated? E.g. participation rate of both women and men in construction activities, repayment rate, number of wells constructed, number of WUAs formed?
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EXAMPLE

In Lao PDR, Village Development Committees prepared their annual work-plan during a joint meeting of all members. Once the plan was agreed it was drawn on a flip chart, using symbols for the main activities. The flip chart was taped to the wall of the house of the Committee Chairman. It served as a useful illustration to explain the annual plan to visitors. At regular intervals, in this case every six months, both the progress made in achieving the plan, and the satisfaction with the foreseen activities was recorded. This was again done during a joint meeting. The flip chart, simplified, looked something like this (source: Jordans, 2000):

	Annual Plan	Six months progress	Satisfaction			Revised Plan
			😊	😐	☹️	
 (Fishponds)	15	5			✓	10
 (House improvement)	20	20	✓			
Etc.						

EXAMPLE









The following example is a data collection sheet that is filled in by women participants in a drinking water supply and sanitation project in India. It monitors the time water is being supplied (morning, noon, evening), the flow of the water at the different times of the day (fast, medium, slow, if at all), the condition of the standpipe platform (clean, not clean) and whether women have organized meetings on water use issues. The figures I - IIIIII represent the seven days of the week.

Figure: 10A

Tool: Participatory Monitoring

Example: Monitoring water collecting patterns and women's participation, India

Source: Bolt, 1994

DAY	TIME WATER IS BEING SUPPLIED			FLOW OF WATER			STANDPIPE PLATFORM		MEETIN
									
							CLEAN	DIRTY	
I									
II									
III									
IIII									
IIIII									
IIIIII									
IIIIII									

Flow: fast (III) medium (II) slow (I) yes (✓) no (x)

10 B Participatory Evaluation: Gender Analysis Matrix (GAM)

PURPOSE

The purpose of the Gender Analysis Matrix (GAM) is to assess the different impacts of the project on women and men. It is also a useful tool for raising awareness of gender roles and situation differences between women and men.

PROCESS

The GAM links the variables **women**, **men**, **household**, and **community**, with **labour**, **time**, **resources**, and **culture**. Project beneficiaries and general community members can be included in a GAM. This is a participatory process that can be used during project monitoring and evaluation to record changes and unexpected results emerging

from the project activities. Such analysis is essential in order to understand the social impacts of the project, whether or not women and men are benefiting from activities, and to identify problem areas.

First ask women and men (separately) how the project activities impact upon their labour, time, resources, and cultural norms. The facilitator would then ask how each particular activity affects the woman or man's labour, time, resources, and cultural attitude.

Impacts should be marked in the appropriate boxes: positive impacts with plus (+) sign, and negative impacts with a minus (-) sign. You could mark no change with a zero if necessary (0).

The output of each matrix will show how a project's activities are affecting the lives of women and men beneficiaries. It is also interesting to ask some members of the general community what their impressions of the project activities within their community are. The matrix should remain with the participants.

MATERIALS

- Flipchart
- Markers

Some SEAGA Questions to Ask While Facilitating

Tool 10 B: Participatory Evaluation

- Is it possible to disaggregate the indicators by socio-economic group? By gender? If so how? If not, why?
- What impact indicators can be formulated? E.g., impact on division of labour, impact on time spent on activities, impact on resources and income, etc.
- Is there a difference in the impact on women and men? If so, why?
- How can a negative impact be mitigated?

EXAMPLE

Figure: 10 B

Tool: Participatory Evaluation

Example: An agriculture project in Bangladesh that focuses on homestead gardening activities.

Variables	Labour	Time	Resources	Culture
Women	+ Vegetables production, nurseries + Produce seedlings and saplings + Skills development + Increased social status	+ Work does not interfere with household duties	+ Food for family consumption - Insufficient training - Unable to control income - Unable to market products - Unable to go to the market - Not enough linkages to other organizations	+ Families are somewhat co-operative - Husbands need to be more helpful and understanding + Communities are less conservative
Men	+ Sell vegetables in market	+ No interference with their other work	+ Earn additional income - Not enough access to quality seeds - Not enough linkages to other organizations	+ Family helps with work + Increased social status
Household	+ Family helps with work	+ Household work is still managed	+ Greater food security + Savings from selling vegetables and seed/saplings	+ Improved household status
Community	+ Neighbours are interested in activities	+ Greater community awareness of project activities	+ Greater availability of agriculture products	+ Community interested in learning too

+ = Positive effect
- = Negative effect

Only women were interviewed for this particular GAM. It is evident from the matrix that the project's activities are having a positive impact on women. However, the matrix also shows that there are some constraints that are hampering women's participation, and some areas that need improvement.

For example, women felt the training they received from the project was insufficient and they identified additional training they would like to have. Marketing was another identified constraint, and women wanted assistance from the project to address this issue. Based on the GAM the project can revise activities and develop methods to address these constraints.

Source: Zaman, F. 2000. CARE, Bangladesh

AnnexII.1: How to Use Additional Field Methods⁴

In addition to the tools described above, below are some general field methods that may be used for the fieldwork. Some additional information is presented on: direct observation, semi-structured interviews, key informant interviews, informal group discussions – and there are also some tips on how to start well.

DIRECT OBSERVATION

There is nothing like seeing something first-hand. Observation is a key method for learning. Direct observations help to support and crosscheck the findings from other methods, and can reveal new details and raise new questions. For every observation made, remember to write down two things: (i) what was observed, and (ii) your interpretation of what it means. Details about what was observed can include: the environment and setting, the protagonists, events and activities and timing. It is important to crosscheck your interpretations with findings from other methods, and from other participants.

Observation is especially useful in the context of gender issues since there is often a discrepancy between what you see people doing and what they tell you they do. Thus, information on the roles of women and men can be crosschecked by observing what is happening both in the field *and* in the villages. The same applies to decision making in meetings and households.

However, remember that your own interpretation of what you observe may be influenced by certain biases, among which could be:

Seasonal bias: You may not be able to observe the whole range of activities and issues because you are visiting an area in either the dry season or the wet season. The seasonal calendar tool may provide you with additional information on seasons that you are not able to observe.

Time of day bias: During field trips, you will be observing mostly in the daytime and may therefore miss out on things taking place at night. For example, a student in Pakistan got an assignment to camp out in the irrigation scheme and observe what was happening at night, especially in respect of night irrigation. He discovered that a number of women farmers were active during the night in field-related farming activities, including irrigating their crops. The reason for them performing these activities at night was to avoid the social disapproval of society regarding women being engaged in these activities. Similar observations have been reported from Bangladesh, where women were seen ploughing fields during moonlit nights.

Road bias: While travelling by car you are able to observe a lot of activities. However, you have to remember what you see may be influenced by the fact that it is quite close

⁴ Adapted from SEAGA Field Handbook, Wilde, V. 1998, FAO/ILO

to the main road. Once again, women may feel less inclined to perform certain tasks that are considered socially inappropriate for them close to a main road where they would be observed.

Cultural bias: While observing you should try to be aware of your own cultural bias, in the sense that your values and beliefs might be different from those of the people you are looking at. Therefore, you will have to crosscheck these values with the participants before formulating value judgements on the basis of your observations

Formality bias: A formal setting with the presence of high-ranking officials may influence the atmosphere, people's behaviour and the type of information that they will provide. An informal gathering may also be conducted. It is important to be aware of how the social setting can influence what you observe.

SEMI-STRUCTURED INTERVIEWS

The semi-structured interview is a method that can be used at any time. It is useful to probe key questions and follow up on topics raised by other tools. Semi-structured interviews can be performed with either individuals or groups.

Unlike structured interviews, which consist of pre-established questions, the semi-structured interview starts with a checklist of issues the interviewer wants to learn about. However, the interviewer should be prepared to be flexible in terms of the order in which topics are analysed. Also, it is advisable to let the interviewee develop his or her ideas, and speak more freely on the issues raised.

The interview should be as relaxed and friendly as possible. How questions are asked depends upon what the participants have to say. This allows a more natural and free flowing conversation, and it also allows for opportunities to raise new issues not anticipated by the interviewer.

KEY INFORMANT INTERVIEWS

Often during fieldwork information gaps, or needs for more precise information, will emerge. In these cases, a semi-structured interview with key informants can be very useful. Key informants are carefully selected people who have a particular knowledge of the topic of discussion. Such interviews are called key informant interviews.

For example, to learn more about water use, key informants who may prove particularly useful may include:

- an old person who knows about the history of water use in the village;
- a chairperson of the WUA who has decision-making power regarding water allocations;

- a poor person who depends on share-cropping land in the irrigation scheme; or
- a woman who actively participates in WUA committee activities.

INFORMAL GROUP DISCUSSIONS

Unexpected learning opportunities often arise during fieldwork, and informal group discussions are a good method for responding to these situations. They simply require a keen interest in listening to people, and some flexibility.

Informal group discussions may be used spontaneously, without a pre-prepared list of questions or issues. If, for example, a group of farmers is encountered during a walk, time should be taken to talk to them about their findings, and to ask about issues that are relevant to them.

Similarly, an unplanned meeting with a group of women at the water point can become an opportunity not only to learn about water distribution issues, but also, depending on what other issues the women raise, to understand more about health problems, horticultural activities and so forth.

HOW TO START WELL

Even with well-prepared and organized plans for the fieldwork, getting things off to a good start upon arrival in the participating community can be a delicate matter. Here are some tips:

- If you can, have at least one team member who is familiar with the area.
- If possible, ask a well-respected local authority or trusted outsider, e.g. NGO or extension worker, to introduce the team to the community.
- Find out ahead of time what the protocol is for introductions. What does the headman or village leader expect? By the elders? Where will everyone meet? What is the best time of day?
- Prepare a clear and simple introduction about why you are there and an overview of the goals and methods to be used. Be careful not to raise expectations about benefits, either in the form of development activities or otherwise, that may not materialise.
- Give a clear and simple explanation about the importance of having both women and men participate, representing both young and old, rich and poor people of different ethnic groups, etc. as appropriate. Ask the community members present whether or not all of the different socio-economic groups are represented, or if efforts need to be made to find and include them.
- Allow time for the community members to ask questions, and answer them as clearly as possible.
- Most community members are not accustomed to being asked by outsiders for their expertise and opinions. A good way to start the process is with a non-sensitive

visual method in which most people can participate, such as mapping the village or irrigation scheme or preparing a seasonal calendar.

- Use simple opening questions like, "I do not know this area very well. I see the tree we are sitting under and the road in the distance, but can you show me what the rest of the village looks like?"

AnnexII.2: Participatory Attitudes and Key Principles in Applying Participatory Methods/Tools ⁵

Generally speaking, participation is a collective action aimed at achieving a common objective; it means, "taking part" and "getting involved". The main task of the facilitator/outside agent is therefore to encourage and involve people in the process or activity.

In a participatory process, persons/groups share knowledge, ideas, opinions, votes, materials, labour, finances etc. in order to reach a common agreement or joint decisions in a transparent way.

There are different levels of participation, ranging from passive participation, where people are involved merely by providing information for others or being told what is going to happen, to active participation/self-mobilisation, where people take initiatives independently from external institutions.

When applying/implementing participatory methods/approaches/tools, it is of vitally important not only to know how a particular participation technique is applied, but also to understand the key principles that lie behind the technique and which attitudes are necessary to enhance a participatory process.

Participatory Attitudes

1. Every idea counts / everybody's view counts

A simple fact neglected by many people is the recognition that different individuals and groups have – according to their respective backgrounds – different perceptions, and assess situations differently. This then leads them to diverse reactions.

This applies to each person – including facilitators and promoters of participatory processes. As a result, there are many interpretations and descriptions of real world phenomena, events and actions.

In all participatory processes, it is fundamental to recognise that everyone is different and can offer important contributions to a process, as his or her views can complement those of other participants, although they may seem worthless or provocative at first sight.

Remember: Where everybody thinks the same, there is not much thinking taking place!

⁵ Adapted from http://www.fao.org/Participation/ft_princ.jsp

2. The learning attitude

Facilitators, promoters and any other person involved in the participatory processes should adopt a learning rather than a teaching or preaching attitude, through which they can learn from the persons or groups they are working with.

This “learning attitude” can be enhanced by recognizing the experiences and knowledge of participants of their own context and living conditions, by acknowledging them as experts in dealing with their own situation and problems. For centuries communities have survived by passing down, from one generation to the next, indigenous knowledge systems on farming, irrigation and water conservation. Thus the role of a facilitator is to enhance the involvement of all the people concerned by the use of supporting processes (such as investigation, analysis and evaluation of problems, constraints and opportunities and taking informed and timely decisions).

3. Transparency

Participatory decision-making requires readiness to reach a "win-win" compromise on all sides. An atmosphere of mutual trust is the basis for constructive co-operation, and transparency from all stakeholders is a basic requirement.

Transparency will help to avoid hidden agendas and suspicion amongst different parties, and thus avoid situations in which stakeholders try to protect their own interests, rather than finding the most suitable compromise for all people.

4. Flexibility

Being open to other people’s ideas and opinions is often the most difficult aspect of participatory processes. Their views may often be difficult to understand, and contradictory or incompatible with one's own ideas and beliefs. Accepting this reality requires a high degree of flexibility, as well as the courage to set aside for a moment one’s own perceptions and follow the process neutrally, being ready to rethink and re-plan, at any stage, if necessary.

Key Principles of Applying Participatory Methods and Tools

1. Leading to action and debate about change

Participatory processes lead to debates about desired changes in existing conditions and hence modifications of the perceptions of participants and their readiness to contemplate action. The process of joint analysis and dialogue helps to define desired changes, and seeks to motivate people to implement them. This action includes local institution-building and strengthening, thus increasing the capacity of people to initiate collective self-help action aimed at improving their own future.

2. Iterative Action and Stepwise Analysis

Participation is an iterative process that should continue throughout the project cycle. Decisions/agreements should be revisited periodically, checked for validity, and adjusted to changes that may have occurred in the conditions/situations/needs.

This implies that analytical processes should follow a stepped procedure. This would mean a focus on general information gathering in the beginning, then on specific topics, and finally to enter into a detailed (in-depth) analysis of local problems, needs and potentials. Additionally, the facilitation team should constantly review their findings in

3. Multiple perspectives / triangulation

Once the different points of view have been taken into consideration, the output of the analysis/discussion will provide a more complete and accurate picture of the situation under review. Therefore, when trying to facilitate a participatory process, one should seek to mix team composition, tools and techniques, as well as sources of information and interest groups:

Team Composition

- multidisciplinary
- gender sensitive
- members with different backgrounds and skills;
- include both insiders and outsiders

Tools & Techniques

- interviewing
- mapping
- diagramming
- ranking
- observing
- discussing and using secondary data

Sources of Information/Interest Groups

- women and men
- elders and youth
- different socio-economic groups
- different professions

4. Flexibility in applying instruments and choosing the degree of precision

There is not a recipe or blueprint on how to facilitate participatory processes. Methods and tools should not be used mechanically, but should be context specific and appropriate to address the question or topic under discussion. The selection of a

particular tool should also be determined by the specific characteristics of the society/community/ group the participation team is working with.

For example, the aim of participatory problem analysis is not to achieve absolute accuracy (one does not have to know or discuss everything), but an appropriate or adequate degree of precision. In order to determine what is “adequate”, facilitators should ask themselves “What kind of information is required, for what purpose, and how much information will people need for their analysis?”.

5. Visual Sharing

Through visualisation within a participatory process, participants have the opportunity to follow a discussion more easily, especially illiterate people and those who are late joining a session. Maps, diagrams, rankings and other forms of visualisation tools also promote consensual decision-making since everybody is able to directly express their opinion on a chart or on the ground.

6. Group Learning

Participatory workshops and other complex participatory processes are best facilitated by the use of multi-disciplinary teams, since the complexity of most situations will only be revealed through group analysis and interaction, thus allowing for contributions from different experts.

7. Self-critical Awareness

Promoters and facilitators of participatory processes must constantly analyse their own biases. This means to continuously reflect upon the phenomena they feel they have perceived, heard and observed, and also those, which they have already judged or interpreted.

Tools adapted from:

- Tool 1: SEAGA Field Handbook, Wilde, V. 1998, FAO/ILO
- Tool 2: SEAGA Field Handbook, Wilde, V. 1998, FAO/ILO
- Tool 3: Jordans and Zwarteveen. 1997. GKF/IIMI
- Tool 4: SEAGA Field Handbook, Wilde, V. 1998, FAO/ILO
- Tool 5: SEAGA Field Handbook, Wilde, V. 1998, FAO/ILO
- Tool 6: Participatory Development Tool Kit, Narayan, D. And L. Srinivasan 1994, World Bank
- Tool 7: SEAGA Field Handbook, Wilde, V. 1998, FAO/ILO
- Tool 8: Participatory Rural Appraisal Handbook. 1992. World Resources Institute
- Tool 9: Participatory Development Tool Kit, Narayan, D. And L. Srinivasan 1994, World Bank
- Tool 10A: Jordans, 2000; Together for Water and Sanitation. Tools to apply a Gender approach. The Asian Experience. 1994. IRC.
- Tool 10B: CARE Bangladesh, Faria Zaman, 2000

References to Examples in Tool Box

Bolt, E. (Ed.) 1994. Together for water and sanitation. Tools to apply a gender approach. IRC International Water and Sanitation Centre, The Hague, The Netherlands: IRC. (Tool 10A)

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Jordans, E. 2000. Lao PDR, Guidelines on Best Practices for Gender Mainstreaming in Alternative Development, Draft Interim Report. UNDCP, Vienna, Austria. (Tool 5)

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Zaman, F. 2000. Gender Analysis Matrix. CARE, Bangladesh. (Tool 10B).

Zwarteveen, M. and Neupane, N. 1995. Gender aspects of irrigation management: the Chattis Mauja Irrigation System in Nepal. Asia-Pacific Journal of Rural Development, October. (Tool 3)

TRAINING GUIDE

Introduction to the Training Guide

Parts of the **SEAGA** Sector Guide on Irrigation can be used in a training context. It is important to recognise that every training situation is different in terms of type and number of participants, objectives, duration of the training, venue, etc. Participants might be planners and policy makers, or technical and extension staff, villagers and farmers.

Because of this diversity, this training guide is not meant to be a comprehensive training manual. However, it does provide some ideas and suggestions. These exercises and materials would probably need to be adapted and expanded by the trainer to suit each specific training context, taking into consideration objectives, the group of trainees, a regional or national context and the time available. It is recommended that use be also made of other training manuals, including the **SEAGA** Training Manual, that cover many basic training techniques and methods.

This Training Guide provides some suggestions on how the tools from **Part II** of this guide can be adapted to become training exercises. Some additional training material is also included, with a number of case studies and a suggestion for the use of a video.

Exercises

The four exercises detailed below are based on four of the tools included in **Part II** of this Guide. These have been adapted so that they can be used in a training context. The main difference between the tools in **Part II** and the exercises in **Part III** is that the tools are predominantly used to gather information and to support a participatory planning process, whereas the training exercises emphasise learning, raising of awareness and initiating a discussion. The training exercises could also be used to train staff in the use of the corresponding tools in an actual field situation.

The following exercises are detailed below⁶:

1. **Task Analysis by Gender (Tool 3)**
2. **Access to and Use of Resources (Tool 4)**
3. **Water Use Matrix (Tool 6)**
4. **Water Users' Associations (Tool 9)**

The remaining tools of Part II can in a similar manner be adapted for use as training exercises.

⁶ These exercises have been used during an international training workshop at the Mediterranean Agronomic Institute in Bari, Italy.

Materials: Case studies

Depending on the training situation and trainees, different materials can be used. If the participants are field staff, such as NGO staff or extension workers, who know a lot about the actual situation, they could work on the basis of their own experiences in a given area.

If the participants do not have detailed practical experience, a case study containing the necessary information can be used. This case study should be collected beforehand, and made suitable for the training. If no case study is available, a study needs to be prepared in advance. Make sure the case study is no longer than two A4 pages, otherwise the time required for reading the information is too long, and participants will be overwhelmed by too many details.

If it is not possible to prepare a local case study, or the group of trainees is composed of different regional or national backgrounds, a choice could be made from the case study material included in this guide:

- **Case Study 1:** Gender Division of Labour in Sidi Bouzid, Tunisia
- **Case Study 2:** Gender Issues and Women's Participation in Irrigated Agriculture, Ecuador
- **Case Study 3:** Video on Gender in Irrigated Agriculture in Egypt
- **Case Study 4:** Water Sources and Uses in Vietnam
- **Case Study 5:** Water Users' Associations in Ghana

Case Study 1 on Tunisia can be used to analyse the gender division of labour and to create awareness of the fact that labour division depends largely on the socio-economic position of the household. The tasks of women from rich families are very different from those of women in poor families.

Case Study 2 on Ecuador can be used to analyse differences between the cultural norms “what women and men ought to do” and what they actually do in reality. At the same time the case study illustrates the impact of household livelihood and household composition on the division of tasks by gender.

Case Study 3, a video on gender in irrigation in Egypt again illustrates the differences between the cultural norms “what women and men ought to do” and what women and men actually do in reality. It provides a very good example which illustrates the fact that gender roles are flexible over time and change as a result of household composition, (widows), or economic processes, (husbands migrating to towns or other countries). The video then discusses the participation of both women and men in Water Users' Associations, and focuses in particular upon their attendance of meetings.

Case Study 4 on Vietnam is an example of a village that has access to different water sources and water uses, and provides information on both the rainy season and the dry season.

Case Study 5 on Ghana documents most issues related to the establishment and functioning of WUAs and women's involvement.

Exercise 1: Task analysis by gender (Tool 3 Part II)

Objective:

To raise awareness and understand how household and community tasks are distributed according to gender, and to understand which factors influence the gender division of labour and analyse the impact of existing cultural norms.

Time: 2 hours (one hour of group work and one hour for presentation and discussion)

Procedure:

1. Divide into groups of 4-5 participants⁷.
2. Review the case study.
3. On a flip chart list the daily activities which take place in a rural household for the cultivation of different irrigated and rain fed crops, e.g. rice, wheat, etc. then livestock keeping, household tasks and lastly community tasks.
4. Categorise all identified tasks according to whether they are generally performed by a man, a woman or both based on the available information.
5. Return to the plenary session.
6. One group presents the flip chart with the gender division of labour. Other groups add issues or comment.
7. Discuss the following questions.

Some Discussion Questions for Task Analysis by Gender

What is the actual involvement of women and men in crop production? (Rain fed and irrigated)

Are there any changes in the gender division of labour compared with what their mothers and fathers used to do? What caused these changes?

What are the constraints and opportunities for the participation of both women and men?

How does the task distribution in female-headed households differ from the above division of labour?

Considering the gender division of labour, who should be involved in irrigation planning activities? Why?

Materials: If no local case study is available, a choice can be made from case studies 1, 2 or 3.

⁷ If the video on Egypt is used for this exercise, it is recommended to watch the video first in the plenary. Then divide the participants into sub-groups for work on the exercise.

Exercise 2: Access to and control over resources

Objectives

1. To discuss gender-based use and control of resources within rural households in participants' geographical areas.
2. To understand who makes decisions about the use of resources, and to discuss who is likely to lose or gain given a particular development activity.

Time: 1.5 hours

Procedure

1. Pick a typical food crop that most people are familiar with (for instance millet, cassava, sorghum, rice, wheat or plantain) and define a geographical area that participants know well
2. Divide into groups of 4-5 participants (if participants are from different areas they can be grouped according to the same areas).
3. Prepare a list of the different resources that are typically necessary for farmers to produce the specific food crop in a given area.

Resources could include land, animals for traction, agricultural implements (hoes etc.), seeds, water, utensils for holding water, irrigation channels, tools for weeding, fertilizer, labourers, harvesting implements, or other items.
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4. Draw or write the names of these resources on small cards. Make two cards for each resource.
5. Draw on a flip chart three large pictures – one of a man, one of a woman, and one of a man and women standing together. Place the pictures on the ground in a row with adequate room between them, or tape them onto the wall
6. Sort the resource cards by taping them under the 3 large drawings depending on who **uses** the resource, women, men or both.
7. Repeat the exercise on a different flip chart. This time focus on who has **control**, or makes major decisions about each resource.
N.B. Only the resources used or controlled 50-50% by women and men are put under the drawing of both; otherwise put the pictures nearer to the woman or the man to indicate who has more control.
8. Come back to the plenary. One group presents the flip chart illustrating the use of the resources. Another group presents the flip chart related to the control of resources.
9. Discuss the following questions.

Some Discussion Questions for the Resources Exercise:

- Do women, men or both use the resources of high value? E.g. land, livestock, technology
- Which resources do women have control over? Which resources do men have control over?
- Do women, men or both make the decisions about high value resources?
- What are the links between women's use and control of resources?
- What are the links between men's use and control of resources?
- What would be the implications of this pattern on the planning of an irrigation scheme?

Materials: Participants' own knowledge and experience

Exercise 3: Water Use Matrix

Objectives

1. To analyse the various water sources and different uses of water.
2. To understand how this information can influence the planning of changes in water uses, e.g. introduction of irrigation.

Time: 1.5 – 2 hours

Procedure:

1. Divide into small groups. Some of the groups composed of only women, and other groups composed of only men.
2. Read the case study.
3. List the main sources of water.
4. Start drawing the matrix on a large piece of paper, by indicating each source of water across the vertical axis. The groups may want to select pictures or symbols to represent each water source, or write them down.
5. List the main uses of water and place them, represented by pictures or symbols or words, across the horizontal axis.
6. Distribute stones or leaves in the matrix to indicate from which water source water is drawn for each use: more stones equal more importance for that particular use (maximum 10). Prepare the matrix first for the rainy season, and then for the dry season.
7. One group presents the matrix for the rainy season in a plenary session. Another group presents the matrix for the dry season.
8. Review the importance of the various water sources, and discuss the differences between women and men regarding their use of water.

Some Discussion Questions for the Water Use Matrix

What are the major constraints in water use for women? For men? What are the main causes? How could these constraints be overcome?

Is quality and reliability of each water source important? If yes, why?

Is lack of water a limiting constraint in the farming system?

Do all socio-economic groups have equal access to water? Which groups have a constrained access? How could their access be improved?

How will a planned irrigation activity affect water uses?

Material: If no local case study is available, case study 4 could be used.

Exercise 4: Water Users Associations (WUAs) and women's participation

Objectives:

1. To discuss in detail the establishment of WUAs, and identify the different relevant aspects of this process.
2. To discuss strategies for involving women farmers in WUAs.

Time: 3 hours

Procedure:

1. Divide into groups of 4-5 participants.
2. Review the case study⁸.
3. On a flip chart, list issues related to the establishment of new WUAs.
4. List the different issues related to the responsibilities and roles of the WUAs.
5. List the issues related to the responsibilities and roles of the different support agencies.
6. List measures to ensure an active role of women in the WUAs, and describe in detail how this can be achieved.
7. Return to the plenary session.
8. One group presents the flipchart related to the establishment of WUAs. Other groups add issues and comment.
9. Another group presents the flipchart related to the roles and responsibilities of WUAs. Other groups add issues and comment.
10. Another group presents the flipchart related to the roles and responsibilities of the support agencies. Other groups add issues and comment.
11. Another group presents the flipchart related to measures to ensure an active role of women in the WUAs. Other groups add issues and comment.
12. Discuss the following questions.

⁸ If the video on Egypt is used for this exercise, it is recommended to watch the video first in the plenary. Then divide the participants into sub-groups for work on the exercise.

Some possible questions for discussion

Water Users' Associations

What are the issues to consider when establishing new WUAs? What are the main incentives for membership?

Are women equally represented and involved in the group functioning (membership, meetings, management tasks)? Are men? Are certain socio-economic groups? If not, why not?

How could the participation of women and certain socio-economic groups be enhanced?

What are the issues to consider regarding the roles and responsibilities of WUAs?

What are the main issues to consider regarding the roles and responsibilities of support agencies?

What are the problems in the co-operation between the water users' association and the irrigation agency, the field staff, different water users? What are the supports?

Material: If no local case study is available, a choice can be made from case studies 3 or 5.

Case Study 1: Gender Division of Labour in Sidi Bouzid, Tunisia⁹

GENDER DIVISION OF LABOUR IN SIDI BOUZID, TUNISIA

In Sidi Bouzid, well irrigation was introduced in 1950. From 1979, the "Projet de vulgarisation agricole dans les périmètres irrigués du Gouvernorat de Sidi Bouzid" coordinated by the Tunisian Government, FAO and SIDA, was implemented in the Valley of Medjerda. It supported the irrigation by "Puits du Surface" (PdS), groundwater wells, on 2500 ha.

The most important agricultural activity is well irrigation, often combined with animal husbandry. People produce tomatoes, potatoes, green peppers, carrots, barley and wheat, with two crops a year. Families own 2 to 10 ha. One well can irrigate 2 to 4 ha, depending on the type of crops. Families that do not have much land often share one well with brothers and other family members. Farmers with more than 4 ha of land normally have more than one well. Most of the families keep some animals. About one fourth of the families keep cattle for milk production. One third of the farmers raise sheep for meat and wool production.

The gender division of labour varies considerably for members of poor and rich families.

⁹ This case study is based on a M.Sc. thesis report by Ms. N. van de Zee and M. Porton, Agricultural University Wageningen, 1988

POOR FAMILIES

Poor families have less land and the quality of the land is poorer. Compared to the rich families, they have less capital and access to information. They had access to the new well technology at a later stage and therefore could not benefit from the high market prices of the 1970s. Due to the lack of access to capital it is impossible for them to mechanise or hire labourers.

As a consequence all family members, including husband, wife and children, need to work hard in the fields. Women participate in all activities in irrigated agriculture, except for land preparation, which is traditionally performed by men. Sowing and transplanting of the crops is very often a woman's task. Women also carry out the second land preparation and weeding. The weeds are used to feed the sheep. Men are involved in applying fertiliser and pesticides.

Water from the wells used to be drawn by using camels. Men would direct the camels and women would carry the water in earthen pots to the field. Nowadays, more and more people use diesel pumps and the water is directed to the fields through small plastic pipes and channels. It is mostly men who have been trained to start, operate and maintain the diesel pumps. Women are still involved in directing the water flow in the field, but their task has become lighter because of the pumps, pipes and channels. However, as the cultivated acreage has become greater and people cultivate two crops a year instead of one, their overall workload has increased.

Harvesting and processing is very often a task for women. Lastly, men are responsible for transporting the produce to the market and selling the crops.

Roughly half of the women of the poorer families work as paid labourers for other, richer families, mainly neighbours and relatives. Women work predominantly in transplanting and harvesting, tasks that are not usually mechanised. For men there are less labour opportunities, since their traditional tasks are more often mechanised, and also because their wages are higher.

Animal husbandry activities are mostly the woman's responsibility, including the milking of cows, the feeding and watering of the animals and the herding of the sheep and cattle. Sometimes, older men and children do the herding. It is mostly women who do the processing of the wool, including the washing, cleaning and spinning. The men dye the wool in the market place.

In addition to the agricultural activities, women are responsible for most household or reproductive activities. They are responsible for preparing food, including the preparation of 'kisra', the bread. Each day they spend about three hours preparing food. They used to have to collect fuel wood, but nowadays they cook on gas, reducing their workload considerably. They also spend time cleaning the house and washing clothes. Looking after children also takes time, although they take small children with them to the field.

RICH FAMILIES

Rich families have more land and the quality of their land is higher. They also have more capital and access to information. The richer families had access to the new well technology at an earlier stage and could therefore benefit from the high market prices of the 1970s. Due to their access to capital, it is possible for them to mechanise and hire labourers from poorer families. As a consequence most family members, including husband and wife, do not need to work in the fields, they just have to supervise the work done by labourers. Men often have jobs in the town, with the government or party, or are traders.

As with the poorer families, women are responsible for animal husbandry activities in the household, but with some help from hired labourers. Women again mostly do the processing of the wool, including the washing, cleaning and spinning, and men at the market place dye the wool.

Again, in the richer families, women are responsible for most household, or reproductive activities. Their daily pattern is similar to that of women in the poorer families, although most children attend school during the daytime.

Case Study 2: Ecuador

Gender Issues and Women's Participation in Irrigated Agriculture: The Case of Two Private Irrigation Canals in Carchi, Ecuador¹⁰

Although women play an important role in water management, there is a lack of research on specific roles, tasks and functions of women in irrigated agriculture, especially in Latin America. The main objectives of this study were to:

- determine the users, their needs with respect to resources, and the different water uses of two irrigation systems, Garrapatal and El Tambo, located in the province of Carchi, Ecuador;
- determine the degree of women's involvement in irrigated agriculture and decision making; and
- identify the factors that limit women's involvement in irrigated agriculture and their participation in water user associations

GENDER DIVISION OF LABOUR

The needs, tasks and responsibilities of water users are influenced not only by their relations to the resource, but also by cultural determinants. **Table 1** presents a picture of what are commonly referred to as male and female activities, tasks and responsibilities as defined by the Mestizo culture. This table was constructed based upon information obtained from 4 focus group meetings, and it represents the general division of labour. Emphasis is given to productive and reproductive roles. The table shows the division of labour based on gender according to the Mestizo culture, which does not necessarily represent what people *actually do*, but the norm in the area (what people *ought to be doing*).

Table 1. Gender division of labour

	Activities	Wome n	Men	Both
Agricultural Activities	Land preparation		X	
	Ploughing		X	
	Planting	X		
	Weeding by hand	X		
	Weeding with hoe		X	
	Fertilising		X	
	Hilling		X	
	Fumigating		X	
	Harvesting			X
	Irrigation			X
	Storing			X
	Threshing			X
Rearing of Small Animals	Feeding	X		
	Forage gathering			X

¹⁰ This case study is based on IWMI Research Report no. 31, written by Elena P. Bastidas.

	Watering	X	
Rearing of Livestock	Milking		X
	Watering		X
	Feeding		X
	Forage gathering		X
	Herding		X
Reproductive Activities	Preparing food	X	
	Cooking	X	
	Fetching water	X	
	Cleaning	X	
	Washing	X	
	Gardening	X	
	Child caring	X	

To compare the description of the roles of men and women based on the cultural or prescribed norms, and of what people actually do, a focus group of 21 women was selected. It was found that gender roles tend to be more complementary. Women were often involved in field activities more than they acknowledged when they were first asked. The women in the group were asked explicitly about their participation in field activities, which are considered to be male activities. Results showed that almost half the women (47%) also worked with the hoe when they worked in the fields, 41 percent irrigated, and 23 percent applied pesticides. Similar information was obtained through household interviews, when women were asked to describe their activities during a typical day.

WOMEN'S INVOLVEMENT IN IRRIGATED AGRICULTURE

The involvement of women in irrigated agriculture was measured in two ways. Firstly by the degree of women's participation in agricultural production, and secondly by the degree of their involvement in decision making regarding the benefits derived from crop production. During interviews, women were asked explicitly about their participation in field crop activities.

A typology based on "household life stage" and "household composition" is used to explain women's involvement in irrigated agriculture. Women's previous background (rural or urban) is analysed for each different type of household.

CONCLUSIONS

The report suggests that taking a closer look at women's urban or rural background, in conjunction with household composition, will give a better understanding of how gender roles and responsibilities are shaped within the household. It also helps explain variations in the gender-based division of labour, and how this affects the participation of women in agricultural activities, decision-making and in the Water Users Associations (WUAs). It was found that women's participation in agriculture is higher in female-headed households, which represent approximately 10 percent of the households in the area of study. Although women's lack of participation in agriculture is similar among the other types of household, reasons for not participating varied widely. In households where the couple still had small children, women's participation in

agriculture was limited by conflicting family obligations. In households with old couples, women were too old or too sick to participate as they used to in agricultural activities. Finally, in mature households where the couple had no small children, women preferred to engage in other activities through which they could control their own income.

In terms of heterogeneity of water uses and users, the study shows how the control over and access to the water resource is influenced by factors such as land tenure, location, gender and labour relations. Although women's participation in water user associations is low, and culture plays a strong role in terms of their decision-making power, women who had a higher than average education occupied positions of leadership in the organizations. Also, women tried to solve their irrigation-related problems through informal means where they had more decision-making power. Therefore, the importance of analysing gender in agricultural production (throughout different life stages), in order to get a broader understanding of factors influencing irrigation is recognised.

This study focused on the Mestizo communities of the middle and the lower zones of the Rio El Angel area, where ethnicity is not an important variable for differentiation. To have a better understanding of the users in the whole area, further research should consider ethnicity as a variable for differentiation as the communities in the upper zone have indigenous Andean influence; while in the lower zone Mestizo communities have predominance.

Case Study 3: Video on Gender in Irrigated Agriculture in Egypt

The video entitled “She Cultivates, She Irrigates”¹¹ has been produced by the Egyptian – Dutch Advisory Panel Project on Water Management & Drainage (APP) – Central Office, Kanater in Egypt.

The duration of the video is 22 minutes.

Procedure:

It is suggested to first watch the video in full. Then, the video could be watched again, but this time the tape could be stopped after each interview to record the information and to discuss some of the issues that emerge.

Contents of the video:

The video shows both traditional irrigation methods and modern irrigation technology such as pumps.

GENDER DIVISION OF LABOUR

Interviews are held with both women and men farmers. They tell their own life stories and explain their role in agriculture. Most women interviewed are very active both in irrigated agriculture and in household work. Some of these women are widows, others are wives of migrant workers, or their husbands work elsewhere in the day.

Interviews with some men confirm the cultural norm that women do not irrigate. One man explains that a woman cannot irrigate because of traditions, because she cannot gather up her dress to work in the fields and because she cannot irrigate at night. Other men explain that times have changed and that women now do work traditionally associated with men.

WATER USERS' ASSOCIATIONS

The second part of the video discusses the participation of both women and men in Water Users' Associations, their access to training and to irrigation engineers.

¹¹ Directed by: Nabeeha Loutfy, Prepared by: Kareema Kamal: Copies of the video can be requested from: SEAGA Programme, FAO: E-mail: SEAGA@fao.org

Case Study 4: Water Sources and Uses in Vietnam¹²

In Kim Lu Commune, Na Ri District, Bac Can Province in Northern Vietnam, the majority of people do not have year-round access to water.

During the rainy season, rainfall is the most intensively used water source for all water uses. The women said “We try to store rain water as much as possible in everything that can contain water”. Rainwater is mostly used for drinking, cooking and irrigation. It is also used for washing, bathing and watering of animals. In the rainy season the river, stream and spring are often used for watering the animals. Pond water is used as well, mainly for watering animals and washing and bathing. Wells are mainly utilized for drinking and cooking, but not for irrigation.

During the dry season in some hamlets water shortage is acute, as there is no water available, the main water sources being the springs, streams and rivers, all located at a distance of 2 kilometres or more from the hamlet. Apart from the distance, these water sources tend to be dirty during the dry season. The water from the river and stream is used for all water uses, including drinking, cooking, irrigation, washing, bathing and for watering of animals. The little water left in wells is used for drinking and cooking. Women are mainly responsible for water collection, and in the dry season they have to travel long distances to collect domestic water.

Water-borne diseases like diarrhoea commonly occur during the rainy season of May through August. This seems contradictory, since during these months a lot of water is available. However, except for springs and rainfall, the water sources are not very clean. The incidence of diarrhoea is also caused by the lack of food during these months and consequent malnutrition at the peak of the agricultural season. Stagnant water and lack of drainage around water storage tanks and latrines form ideal breeding places for mosquitoes.

Opportunities for improvement include the construction of rainfall storage tanks or piped water supplies, and installation of water filters to purify water.

¹² Based on mission report by Jordans, E. 1999. “Gender Issues in Cao Bang – Bac Can Rural Development Project. Findings and Recommendations.”, Vietnam.

Case Study 5: Water Users' Associations in Ghana

Republic of Ghana – Upper East Region Land Conservation and Smallholder Rehabilitation Project (LACOSREP)¹³

The Upper East Region Land Conservation and Smallholder Rehabilitation Project (LACOSREP), an agricultural development project, is implemented in the Upper east Region of the Republic of Ghana, with funding from the International Fund for Agricultural Development (IFAD). Its overall objective is to increase the food production and the income of the poorest families on a sustainable basis. Female-headed households constitute about 20 per cent of all households and are identified as the poorest of the poor. It was planned that all newly irrigated lands (205 ha) would be allocated in plots of about 0.05 ha to 4100 women producers, with priority extended to female-headed households.

The main farming system in the Upper-East region is rain fed mixed cropping on permanent farms. In the inundated valley flood plains and irrigated areas, rice is grown during the rainy season, and tomatoes, pepper and onions are planted during the dry season. Livestock production is an important part of the farming system. Cattle and small ruminants are grazed as free moving herds.

The project planned to finance the rehabilitation of small dams and the construction of dugouts. Irrigation is crucial; without it farmers in Upper East Ghana must migrate during the dry season. The institutional set-up of the project is as follows:

The Irrigation Development Authority is responsible for the implementation and supervision of the rehabilitation, including soil and water conservation practices in the catchment area and structural maintenance of the dam outlet, outlet infrastructures and watering troughs.

The Department of Agricultural Extension Services provides technical assistance to the users for maintenance of the distribution systems beyond the turnout gates.

The Crop Services Department is responsible for catchment area protection, including bunding, tree planting and grassing.

An identification mission recognised the need to charge a specific target group with the responsibility for managing and maintaining the dam facilities. Thus a Water Users' Association programme was set up within LACOSREP. The objective of this programme was to establish strong and independent yet democratically run WUAs, which would take over the management of rehabilitated dam schemes at the end of the project period of six years. The identification mission identified three predominant groups of stakeholders: gardeners, livestock owners (coinciding or not with gardeners) and fishermen. The main WUA was defined as a combination of these subgroups, with an executive body

¹³ Based on various Project Documents, International Fund for Agricultural Development (IFAD), Rome.

comprising members from each of the three sub-associations. Membership of the WUAs was planned to include all those members of the target groups who would benefit from the results of the project.

At the time of the Interim Evaluation in February 1998, out of the total 44 dams rehabilitated, 27 dam site WUAs had been established comprising of representatives from one to three subgroups. In the remaining 17 sites, associations of one to three of the subgroups were established, but they had not yet formed a co-ordinating WUA. Women accounted for 34% of the overall membership. Gardeners appeared to be by far the most dominating subgroup in WUAs. The loan agreement mandate that land would be allocated to female-headed households first was not applied at most dam sites. In general, women's plots tended to be smaller (almost half the size), and women shared plots more often than men. In addition, the location of women's plots in the command area was often less favourable than that of men.

LACOSREP offered substantial material incentives for farmers, livestock keepers and fishermen to participate in rehabilitation and WUA activities, including food rations and improved irrigation facilities. The appointment of WUA facilitators, and the support from the government and project team for WUA establishment, strengthening and take-over of Operation and Management (O&M), proved to be very constructive. The recognition of different stakeholder groups, and a flexible approach to WUA membership further facilitated the WUA development. The formation of WUAs was carried out in the nature of a training programme that evolved during the course of the implementation. The Department of Extension Services appointed two District Facilitators for each district to serve as WUA programme promoters. Agricultural Extension Agents were trained in reservoir rehabilitation and catchment area protection, and worked in close liaison with WUAs.

One of the tasks of the WUAs was to collect water fees directly from farmers in order to cover the Irrigation Development Authority inspection and maintenance programme. In addition, water charges for the use of separate livestock watering facilities needed to be paid. The WUAs would also be responsible for catchment protection activities. Farmers would contribute their own labour to the operation and maintenance activities at the rate of about 10 person days each per year, 5 for each season. O&M tasks included operating the dam outlets and irrigation control systems, mending and cleaning the irrigation distribution and drainage system and fence erection and maintenance

Although the above factors contributed to WUA performance and sustainability, some factors were identified that constrained the performance of the WUAs. The project's flexibility towards WUA formation led to a lack of internal regulation and transparency in the objectives, responsibilities and resources of WUA operations. Consequently WUA performance was in some cases weak, especially in keeping records and in financial resource mobilisation. In some dam sites this was due to limited availability of water, and in others to ethnic disputes. Lack of integration of wet and dry season farmers, and therefore reduced overall involvement of users in the O&M of the schemes, meant that schemes did not operate to their full potential. The process of legalising the status of WUAs was only initiated towards the end of the project as the need for entering into

legally binding agreements regarding the operation and maintenance, as well as ownership and control over land at the dam sites became apparent.

Women's WUA membership had declined by 30% at the end of the first stage, suggesting that those who originally participated actively in the construction work as labourers, and registered initially as WUA members, had subsequently not benefited from the project in terms of irrigated plots. Thus women were discouraged from further membership. Some of the factors that cause these patterns are:

- gender insensitivity of project staff;
- key posts being typically held by male representatives of the landowners and other powerful people;
- women's low literacy level as compared to men's;
- local traditions; and
- water management and maintenance being perceived as "masculine" tasks.

In the project design, mechanisms to reach women, especially female-headed households, included:

- giving priority to women for newly irrigable lands;
- mobilising women into groups, and training them to access project services and credit; and
- designing crop packages specifically for target group women.

From this it can be seen that there is some definite encouragement of women's participation in project interventions, notably in increasing their access to training in income-generation activity skills, crop technologies and credit. Gender targeting had been applied less and was therefore less successful in enabling women to have equitable land allocation and management responsibilities at rehabilitated dam sites.

When introducing the WUA programme to a community for the first time, LACOSREP approached the chiefs and local opinion leaders, all of whom were men. From the beginning, there were no measures for directly involving women. This resulted in a low representation of women as WUA members, and consequently they were under-represented in decision-making bodies.

A number of strategies to overcome these constraints were recommended by the Interim Evaluation mission:

- The preparation of and agreement on WUA bylaws, followed by official registration of WUAs as legal entities, is an essential process.
- Provision for proportional gender representation, as well as the criteria for land allocation, should be incorporated in these bylaws.

- Gender-awareness training was considered necessary in order to address the persistent inequity in distribution of food rations and access to land.
- Training should be given to WUAs on record keeping, realistic financial resource mobilisation and transparent decision-making.

Furthermore, it was recommended that ethnic disputes must be resolved *before* dam rehabilitation starts.

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