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Pilot programme for strengthening WUAs

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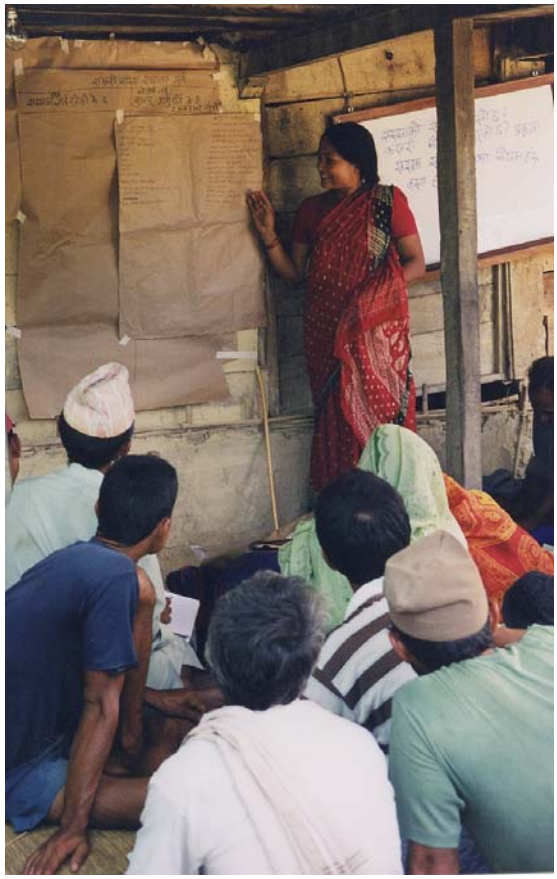

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Pilot programme for strengthening WUAs

Nepal

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List of Contents

Page

Chapters and Appendices

1 Introduction 1
1.1 Background 1
1.2 Objectives 2
1.3 Study Method 2
2 Background to Study 5
2.1 Development of Approach for Institutional Strengthening in this Study 5
2.2 Study Method – Diagnostic Learning and Water Users' Schools 6
2.3 Formation of Study Implementation Team 8
2.4 Selection of Sub-Projects 9
3 Diagnostic Learning and Action Planning Process 11
3.1 Rationale and Objectives 11
3.2 Appropriate Field Techniques 11
3.3 Description of Tools Used 16
3.4 Practical Problems in the Field 27
3.5 Practical Solutions 28
3.6 Extent of Detail Needed 29
3.7 Action Plans 29
3.8 Reporting 30
3.9 Outline Plan for DL/AP 30
4 Water Users' Schools 33
4.1 Introduction 33
4.1.1 Objectives 33
4.1.2 Concept of Water Users' Schools 33
4.1.3 Numbers of Schools Run during this Project 34
4.2 Design 35
4.2.1 Curriculum/Themes 35
4.2.2 Participant Selection 36
4.2.3 Location Selection 37
4.2.4 Role of Major / Minor Schools 38
4.2.5 Staffing 38
4.3 Implementation 39
4.3.1 Session Timetable and Plan 39
4.3.2 Teaching Methods 40
4.3.3 Sessions of Particular Interest 43

4.3.4 Exposure Visits 44
4.3.5 Linkage with Other Tiers of WUA and Agencies 44
4.3.6 Reporting 45

5 Dissemination of Findings 47

6 Impact of the Programme 49
6.1 On Participants 49
6.2 On the Wider Community 50
6.3 On the Water Users' Association 50

Appendix A: The Logical Framework A-1

Appendix B: Maps of Sub-Projects B-1

Appendix C: Review of Past Projects C-1
C.1 Lessons Learned from SMIP in First Phase of this Study C-1
C.1.1 Diagnostic Studies in Monsoon 2002 C-1
C.1.2 Legal Aspects of Irrigation Management C-2
C.1.3 Technical Features of SMIP C-2
C.1.4 Observations from Field Studies at SMIP C-3
C.1.5 Conclusions from SMIP C-6
C.2 Lessons Learned from other irrigation projects C-7
C.3 Lessons learned from other sectors C-10
C.4 Summary of Lessons Learned C-12

Appendix D: Table of Contents for DL/AP Report D-1

Appendix E: Standard Matrix for Performance Monitoring E-1

Tables

Table 2.1: Shortlist of Schemes for Detailed Study 10
Table 4.1: Number of Water Users' Schools 34
Table 4.2: WUS Curriculum: Special Topic Sessions 35

Figure 2.1: Project Location 9
Figure 3.1: Typical DL/AP Programme and Inputs 28
Figure 4.1: Typical Water Users' School Programme and Inputs 31

Glossary and Abbreviations

adhiya	Sharecropper (form of land tenure)
ailani	Government land, typically along canal or river banks, may be occupied by landless
AMIS	Agency-Managed Irrigation System
bandaki	Mortgage (form of land tenure)
bataiya	Sharecropper(form of land tenure)
BIP	Bijaypur Irrigation Project
CBO	Community Based Organisation
CMIASP	Community Managed Irrigated Agriculture Sector Programme
DADO	District Agricultural Development Office
DL/AP	Diagnostic Learning and Action Plan
DOA	Department of Agriculture
DOI	Department of Irrigation
FMIS	Farmer-Managed Irrigation System
ICM	Integrated Crop Management
KUIS	Kamala Uttarbahini Irrigation System
NGO	Non-Governmental Organisations
SAGUN	Strengthened Actions for Governance in Utilization of Natural Resources
FFS	Farmer Field Schools
FGD	Focus Group Discussions
ICWM	Integrated Crop and Water Management
ISF	Irrigation Service Fee
IPM	Integrated Pest Management
OFWM	On-Farm Water Management Programme
PCPS	Problem Census and Problem Solving
PLA	Participatory Learning and Action
PRA	Participatory Rural Appraisal
SImT	Study Implementation Team
SMIP	Sunsari-Morang Irrigation Project
SWOT	Strength, Weakness, Opportunities and Threats
theka	Contract (form of land tenure)
WUA	Water Users' Association
WUC	Water Users' Committee (one part of WUA at SMIP, responsible for about 750 ha)
WUG	Water Users' Group (lowest tier of WUA at SMIP, responsible for 25-30 ha)

Summary

This report describes the background to and the process adopted for strengthening WUAs in this project. Although a huge effort has been put into transferring management of parts of irrigation systems to the users, there are still significant problems particularly in encouraging participation in agency-managed projects. Irrigation Management Transfer has been part of government policy in Nepal as it has been in many other countries for over a decade now, but satisfactory methods have still to be identified.

Following on from a rapid review of irrigation management on about 20 projects in Nepal, and a smaller number in China (Part 2A of this report), we have attempted to develop and field test an improved method.

This method aims to use a participatory process of institutional strengthening, in order to change attitudes, promote a sense of ownership and develop the skills needed to manage the system. There were two main stages to the process:

- Participatory studies to understand the system and engage the stakeholders in the process of institutional development – this phase was referred to as diagnostic learning and action planning (DL/AP); and
- Water Users' Schools (WUS) to build the skills, awareness and understanding to manage the system, and through this to develop the social capital needed to sustain this management.

This report describes the process adopted for these two activities at eight locations on three projects: Sunsari Morang Irrigation Project, Kamala Uttarbahini Irrigation System, and Bijaypur Irrigation Project.

The first stage was to form a well-motivated multidisciplinary team with the right balance of technical and social skills, well-versed in the concepts and techniques of participatory studies, and then to develop the detailed programme in conjunction with them.

Diagnostic Learning and Action Planning (DL/AP)

The objective of the diagnostic learning and action planning (DL/AP) process was to:

- identify and involve all groups of stakeholders in the study; and
- collect sufficient information to establish a baseline of the characteristics of the area and develop and implement an action plan for the next stage of institutional development.

The DL/AP involved some data collection but that was not its primary objective: the process and who is involved in it were more important.

The participatory techniques used for DL/AP are not new but they did need to be adapted to the specific situation and requirements of these projects – particularly to cope with the complex systems of land tenure, and differences between settlement patterns and irrigation system layout. The process started with social and resource mapping to identify the irrigation network and the various groups of stakeholder, and we then did well-being analyses to identify appropriate groups for

more detailed discussions and investigation of other issues – such as seasonal migration and off-farm employment, multiple uses of water, gender differences in access to water and involvement in water management.

We first divided the sub-project into units with areas of about 30 to100 ha, and a population of up to 100 households and worked with them for four to ten days, taking great care to ensure that we kept everyone fully aware of what we were doing and why. After completion of the work in three to four adjacent units, we synthesised the findings into an action plan and curriculum for a Water Users' School. This process in itself made some stakeholders more aware of their system and stimulated them to take action to improve management.

Water Users' Schools

Water Users' Schools are a series of weekly half-day workshops for the duration of a cropping season, during which participants discuss management issues in an informal and relaxed environment. The participants are selected at the end of the DL/AP stage so that all categories of stakeholders (particularly the poor and vulnerable) are represented. The objectives are to

- Help participants to identify and solve critical local problems,
- Build awareness of role of WUA,
- Develop skills in irrigation management, and
- Make links with external stakeholders.

In addition we ran a series of 'Minor Schools' to disseminate findings to the wider community, and ensure that their views were taken account of in the Major School. These were facilitated by participants from the Major School.

The concept builds on the 'learning by doing' approaches used in Farmers' Field Schools elsewhere but extends them to be much more than a form of training for individual farmers. The WUS cover wider issues of institutional development, group action for managing canals, and problem identification and solving. Participants are purposively selected to represent all sections of the community and to ensure that the learning is disseminated widely.

The methods used are a mixture of practical exercises (in demonstration plots or canals); group work to solve specific problems identified in the field; games, songs and role plays; and development of specific technical or institutional skills. The techniques are based on the principles of adult learning and do not depend on all participants being literate.

There are of course many challenges, but the approach was designed to minimise these:

- Elites may find the WUS threatening to their privileged position,
- Illiterate and vulnerable groups are reluctant to attend,
- Some concepts are abstract and it is difficult to make them interesting, and
- There is a reluctance to focus on specific problems that can be solved, rather than discuss wider but more intangible and less solvable issues.

As a result,

- Participants learnt analytical skills and the ability to prioritise and solve problems.
- Women and socially vulnerable groups developed the confidence to present their views in mixed public meetings.
- Water users gained an understanding of needs and responsibilities for irrigation management, and enhanced their sense of ownership for their system.
- Users learnt to provide pressure for change and motivate inactive WUAs.

Costs of Implementing this Programme

Typical costs have been estimated from the costs of running this programme in this study to be about NRs 2,000/ha (£ 16/ha) for DL/AP and NRs 2,250/ha (£ 17/ha) for a WUS for one season. The actual costs might vary from this because of different implementation arrangements and are likely to be less since this was a pilot programme during which we developed and gradually optimised the techniques and documented the entire process for research purposes.

Impact of Programme

The DL/AP helped:

- Water users become more aware of their role in relation to the irrigation system.
- To provide a forum for users to express their views and to start improving communication and trust between users and WUA.
- To enable users to identify and think about solutions themselves.

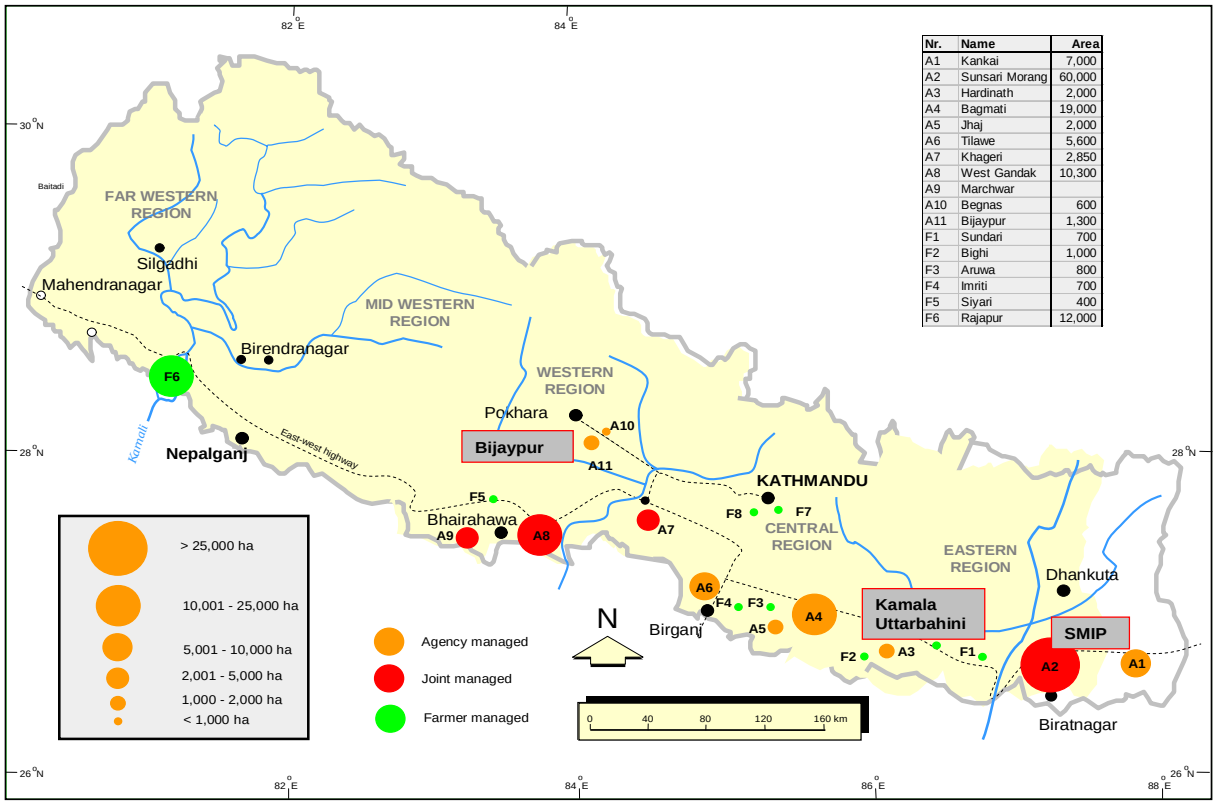
The WUS resulted in changes in perceptions and attitudes of individual stakeholders in a way which ensured that their improved skills and knowledge led on to enhanced social capital as well as physical, natural and financial capital.

BIP: sub-committees were formed to manage sections of the branch canal; improved procedures and record keeping were introduced; the WUA gained a greater ability to mobilise farmers for collective work; and the leadership became more motivated to manage the system.

SMIP: responded to pressure from members to organise some meetings at the lower levels of the WUA ie the Water users' group (WUG) and Water users' committee (WUC), but most people felt that new elections are essential to give the WUA credibility; until these could be arranged, they relied on more informal arrangements for improving management. These *ad hoc* groups arranged canal cleaning and managed water more efficiently than in the previous year.

KUIS: the branch committees gained status and became more active and responsive to farmer needs. The main committee improved procedures and was able to mobilise exceptional resources for maintenance in a year when the river conditions made the system extremely difficult to manage. Women were included in decision-making (as well as being permitted to participate in field activities).

Project Location



Nr.	Name	Area
A1	Kankai	7,000
A2	Sunsari Morang	60,000
A3	Hardinath	2,000
A4	Bagmati	19,000
A5	Jhaj	2,000
A6	Tilawe	5,600
A7	Khageri	2,850
A8	West Gandak	10,300
A9	Marchwar	
A10	Begnas	600
A11	Bijaypur	1,300
F1	Sundari	700
F2	Bighi	1,000
F3	Aruwa	800
F4	Imriti	700
F5	Siyari	400
F6	Rajapur	12,000

Field inspections of a canal (at SMIP) for planning maintenance, and working in small groups as part of Water Users' Schools.

1 Introduction

1.1 Background

In Nepal, government investment in irrigation development began in the early 1950s. As in most countries at that time, efforts were concentrated on the construction of infrastructure, and much less attention was paid to operation and maintenance aspects or water management. The farmers were not involved in the various stages of the process such as policy-making, project planning, design of infrastructure, project implementation, resource allocation, benefit-sharing, or ownership of the system. These projects are referred to as agency-managed irrigation systems (AMIS), and many of them did not function well from the beginning or are now performing below expectations, and there have been continued efforts to rectify this situation. There were also many traditional, farmer-managed irrigation systems (FMIS), but these were not formally recognised and the Department of Irrigation (DOI) was not involved in them at that time (although many did get some government or external support in various ways).

Early attempts to improve the situation focused on physical reconstruction or modification, or more intensive development of infrastructure. This remains important, but recently more emphasis has been given to involving stakeholders by encouraging strong Water Users Associations (WUAs) so that they can become responsible for aspects of management. This is beneficial both in terms of empowering the stakeholders and in terms of efficiency of development (water users understand the local situation and their requirements so that they can ensure that the project is designed to suit their needs, and they have a long-term interest in it being managed well).

There has been some success with this policy of encouraging participatory irrigation management which began in Nepal in 1992 with a new irrigation policy – both on newly constructed Government-run schemes, and also for improving traditional farmer managed schemes. However, as noted elsewhere in this report this is an ongoing process and there are still considerable problems in making these management systems sustainable and ensuring that the benefits of irrigation are shared fairly. Irrigation is a dynamic socio-technical process and needs to respond to changes in the beliefs, perceptions, aspiration and behaviour of farmers.

There have been many attempts to improve irrigation management since the new policy was introduced. These have been increasingly refined and become more subtle in their approaches – current programmes include the Nepal Irrigation Sector Project (World Bank supported), the SAGUN[1] programme on projects handed over by the government to the users, and the CMIASP[2] programme for strengthening farmer-managed irrigation. Some initiatives for institutional development have been driven by donors or other outsiders, and some have generated frustration by attempting to impose ideas or notions of equity which are perceived by some to be inappropriate (Pradhan, 2000)[3].

Such activities are often part of a project in which the majority of the investment is for development of the infrastructure, with minimal resources being allocated for 'software' such as capacity building and development of Water Users' Associations (WUAs). Construction works then often become the dominant feature of the project, with the software being done in a more haphazard way towards the end of the project, even though the budget required is relatively small. There is still inadequate recognition of the need for and best way of carrying out such software activities. The present study was an action research project which had no resources available for infrastructure, and focused exclusively on institutional development.

[1] Strengthened Actions for Governance in Utilization of Natural Resources (USAID-funded programme)

[2] Community Managed Irrigated Agriculture Sector Programme (DOI-ADB)

[3] Pradhan, Rajendra. F. von Benda-Beckmann, and K. von Benda-Beckmann eds (2000). *Water, Land and Law: Changing Rights to Land and Water in Nepal.* Kathmandu, Nepal: Legal Research and Development Forum.

1.2 Objectives

The study aimed to test the hypothesis that:

> *Users can manage irrigation sustainably if they are helped to set up local institutions in accordance with their own requirements*

This broad hypothesis led on to three more specific questions:

- How could we (and the users) understand local requirements and strengthen WUAs in ways which meet these?
- How could we encourage WUAs to be more representative and act in the interest of all their members?
- How could we ensure that vulnerable groups within the community benefit from irrigation?

The study took the form of a pilot programme for strengthening Water Users' Associations (WUAs) which was undertaken at several locations on each of three large and medium scale projects in Nepal. This followed on from a reconnaissance study (Part 2A of this report) of the problems that have been encountered with participatory irrigation management and irrigation management transfer in Nepal.

The three projects selected were

- Sunsari-Morang Irrigation Project (SMIP) (sub-secondary canal SS9E, but focusing on three tertiary canals representing head, middle and tail of the sub-secondary canal which is itself in the middle of a middle secondary canal)
- Bijaypur Irrigation Project (BIP) (branches 3 and 4, representing the middle and tail of the system)
- Kamala Uttarbahini Irrigation System (KUIS) (whole system)

Maps of these three projects are given in Appendix B. Details of the activities, observations and conclusions from these three case study projects are presented separately in Part 2C of this report. This report describes the general approach and methods applied to each project, and makes some recommendations for further improvements in future applications of the methods.

1.3 Study Method

We followed a series of steps in carrying out this project, reflecting the need to build on lessons learned in previous stages and to develop the awareness and capacity to carry out the next step.

This report is structured around this incremental approach as follows:

- Review of previous experiences with WUAs in Nepal (Stage 1 report of this study), followed by direct observations and focus group discussions in part of SMIP during the monsoon irrigation season (Appendix C)
- Review of objectives of study, in the light of these findings and experiences in other sectors (Chapter 2 and Appendix C).
- Consideration of possible approaches to achieving these objectives, including selection of case study sites (Chapter 2)
- Initial diagnostic learning studies in two sub-areas to develop techniques (Chapter 3)
- Initial Water Users Schools to refine concepts and approaches (Chapter 4)
- Diagnostic studies in remainder of study areas (Chapter 3)

- Implementation of Water Users Schools and related activities (Chapter 4)
- Support to field activities (Chapter 5)
- Initial evaluation of impact of process on participants and the wider community (Chapter 6)
- Synthesis of findings and analysis of conclusions from case studies (Appendices to Part 1 of overall report)
- Drawing lessons from case studies to provide guidelines for supporting WUAs (Main text of Part 1 of the overall report).

2 Background to Study

2.1 Development of Approach for Institutional Strengthening in this Study

This study built on a reconnaissance of WUAs set up under previous projects, and aimed to develop an approach for participatory irrigation management which is more sustainable and better focused on alleviating poverty.

It was noted in the reconnaissance study that many of the problems encountered in these earlier projects and the weaknesses observed in Sunsari Morang Irrigation Project, as described in Appendix C, can be attributed to the top-down, centrally governed, 'blueprint' approach and process used for institutional development. Water users' institutions have often been set up in a standard format, rather than building up from local knowledge, social relationships and traditional arrangements. Nepali farmers have wealth of knowledge and skills to manage irrigation systems, and they have their own irrigation culture. But these skills were either not recognised while setting the institutional arrangements or, conversely, it was assumed that no institutional development was needed because of these traditions. As a result, new associations became artificial and were not embedded in the local culture – so they often lapsed after the construction phase and became rather reluctant to take on O&M responsibilities. This left an institutional vacuum which encouraged negative discussions and ill-focused criticisms, and resulted in poor service delivery.

The approach in the implementation stage of the study was to develop and test a participatory process of institutional strengthening, in order to change attitudes, promote a sense of ownership and of belonging among water users, and develop the skills needed to manage the system. The sense of ownership should make water users interested in sustaining their system beyond the life of the study, and the enhanced knowledge should give them the capacity to do so (although it is still recognised that they may need some simple follow-up support services after the study is completed).

The study also aimed to yield insights into how to promote good governance of WUAs more widely, as well as provide direct benefits to the water users including the landless and women who participated in the action research. Women were included as a specific target group since they are traditionally excluded from management, but also play an increasing role in irrigated agriculture because of male migration for employment which is a dominant feature of rural Nepal. Landless people within irrigation schemes were also a focus because they also use canal water directly or indirectly, and irrigation is a crucial feature of their livelihoods (Smith, 2004)[4]

Participatory learning tools were used to establish a baseline of the characteristics of the area of intervention; to involve irrigation stakeholders (irrigators, water users other than farm irrigators, Community Based Organisations (CBOs) and government line agencies working in the area); and to diagnose the strengths and weaknesses of their assets and institutions. The water users were then helped to apply their findings and diagnosis of the issues to develop an action plan for improving the efficiency and equity of irrigation water use on their system by their WUA.

This action plan was implemented through a Water Users' School (WUS) which was a season-long form of participatory learning which aimed to develop skills and awareness and thereby promote a strong, active, and well governed Water Users' Association. As well as developing the skills of the direct participants, this was aimed at disseminating this knowledge to other water users and ensuring that the interests of non-participants were incorporated in the process adopted in the WUS. The WUS also aimed to help the users and WUA to establish and maintain their own linkages with other WUAs

[4] Smith, LED (2004) Assessment of the Contribution of Irrigation to Poverty Reduction and Sustainable Livelihoods, International Journal of Water Resources Development v20 n 2 pp243-257

up the system hierarchy, and with line agencies, other service and input providers, Non-Governmental Organisations (NGOs) and CBOs, and the private sector.

A livelihood analysis provides a useful framework for this intervention. The entry point for improving irrigation management was through building human capital - developing the awareness, knowledge and skills of water users. They could then use this to build social capital, and strengthen their WUA. The technical skills and institutions then enable better defined rights to and more efficient use of water (natural capital) for agriculture and other purposes, and ensure that resources (financial capital) are collected and managed in a sound way so that infrastructure (physical capital) can be maintained in a more sustainable way.

2.2 Study Method – Diagnostic Learning and Water Users' Schools

The study method included the following key elements:

- Participatory analysis and action planning from the lowest level upwards
- Water users' schools to implement the action plan, and
- Integration of technical and institutional aspects.

(i) Diagnostic Learning and Action Planning (DL/AP).

- In SMIP the watercourse, with an average command area of 25-30 ha, is the base level hydrological unit within the WUA institutional structure. The Water Users' Group (WUG) represents farm holdings within a watercourse. Each watercourse generally has between 30 and 50 affected households (landholders and others) – which is a manageable number for applying participatory approach and methods.
- The study team took care to incorporate all land that is actually affected by the watercourse, including drainage areas, highlands, etc. In other words, the team does not confine itself to the theoretical hydrological boundary of the watercourse or of the tertiary.
- The study method relied on participatory analysis tools and techniques to promote the active and meaningful involvement of all social groups affected by the irrigation system in diagnosis, planning and implementation of study interventions – this included those who are usually excluded (such as women, sharecroppers, and landless labourers).
- A participatory examination and observation of irrigation water distribution and management, and related institutions, as well as an exploration of agronomic practices, was used to develop an action plan to support more efficient and equitable use of irrigation water in each watercourse.
- This process was repeated for each watercourse within a tertiary canal so that all watercourses within the tertiary command are covered – this is a hydrological unit with a command of approximately 150 ha. The individual watercourse action plans were then synthesised into a tertiary level action plan. In other schemes with a different irrigation structure, an equivalent hydrological and social unit in which to initiate work was first identified by sitting together with both farmers and social leaders.

(ii) Water Users' Schools

- The entry point for implementation of the action plan was the Water Users' School (WUS). The curriculum for the WUS was based on the priorities identified by water users as addressed and incorporated in their action plans, but structured around the themes of agriculture, water management and maintenance of infrastructure, and institutional development.

- The Water Users' School concept draws on the valuable experience gained through a range of Farmer Field Schools (FFS) in Nepal – such as IPM (integrated pest management), ICM (integrated crop management), the FAO-supported On-Farm Water Management Programme, and the Integrated Crop and Water Management Field School being pilot tested in Stages I and III of Sunsari Morang. International experience with FFS was also reviewed, but despite valuable work done by FAO[5] and a small number of other studies[6] little has been done on irrigation management except at farm level.

- There was one Water Users' School for each participating tertiary. Each WUS met on a regular basis (normally weekly), and incorporated a farmer-managed experimental / demonstration plot. About six WUS participants were selected from each watercourse within the tertiary, chosen so as to be representative of all social groups within the watercourse, with special attention to the socially disadvantaged and marginalised poor and women. These WUS participants became animators/facilitators for their watercourse.

- In addition to being trained through the WUS, the animators were required to return to their watercourse, establish small demonstration plots at 'Minor Schools', disseminate their learning in a systematic way to users on their watercourse and elicit their views. This became a kind of cyclic process of learning and dissemination. The animators were provided with a suitable package of inputs to establish their demonstration plots, and were required to report back to the WUG on matters related to WUG administration and governance.

- The schools were not designed for transfer of knowledge to the participants, but aimed to help the participants identify, understand and solve the problems that they faced. This was an important difference from the more technical focus of FFS that had previously been run in Nepal.

- The WUS helped the animators to promote linkages and coordination between strengthened water users' institutions and DOI, officers of other agencies, such as Ministry of Agriculture and Co-operatives, Ministry of Water Resources, and agricultural supply, credit and marketing agencies, the NGOs and CBOs (the civil societies).

- The animators worked with the WUG to build on the baseline assessment by conducting ongoing monitoring and evaluation of the activities and effectiveness of their water users' institutions.

(iii) Integration of Technical and Institutional Studies

The action plan and the curriculum of the Water Users' School aimed to improve the participants' understanding of technical as well as institutional aspects of overall irrigation management. Among the topics that are addressed are:

- the technical basis of scheme design and the implications of modifying system operation;

[5] FAO Land and Water Digital Media Series "Participatory Training and Extension in Farmers' Water Management", 2003
[6] eg. Hussein S, Adam, AAW and Takeshi HATA, "Promotion of Participatory Water Management in the Gezira Scheme in Sudan"

- techniques for controlling water level without reducing discharge significantly;
- ways to manage water equitably when water is scarce and when there are various sources of water and drainage is reused;
- management procedures to ensure that the system can deliver water in accordance with a plan agreed with the users;
- review and assessment of institutional status of irrigation institutions and how they can improve management to satisfy the water users.

The operational studies which were implemented at SMIP from June 2002 to June 2003 highlighted several aspects or problems of water management, in particular the increasing divergence between theory and practice (both in construction and operation) down the system and the extent of local variations in requirements which have significant implications for management. These were addressed in the relevant sessions, and helped the users understand the reasons for the problems that they faced and how they could best manage them – they may have to work within and cope with certain constraints rather than expect an ideal solution to be delivered to them.

(iv) Implications for Action Research

As an action research programme, this study aimed to promote learning with, as well as by, water users. Accordingly, the process of study implementation was a rich source of insights for ways to achieve good management. The study team carefully documented the issues and concerns of various stakeholders within the system (individuals, WUAs and CBOs), locally (line agencies, local government, and NGOs), and nationally (DOI, consultants and NGOs) at each stage of the process (planning, diagnostic studies, water users' schools). The team then analysed how these factors affected the establishment of sustainable and effective water users' institutions, in order to derive recommendations for government policy and legislation and their practice.

2.3 Formation of Study Implementation Team

A study implementation team (SImT) was formed of professionals from DOI, Department of Agriculture (DOA) and a national level NGO. This ensured a broad base of appropriate skills, knowledge and practical experience. The nature of this project was rather different from earlier intervention, so considerable time was spent building the team and developing the innovative ideas and approaches together. The team comprised an agriculturist, an institutions specialist, an irrigation engineer, a junior sociologist, and a participatory learning and action (PLA) specialist. Local field assistants were recruited in each sub-project to support the SImT.

They were supported by an international team, comprising a water management specialist and a social anthropologist, in the initial direct implementation of the study activities and later in backstopping of local NGOs.

The process outlined above in section 2.2 was developed by the SImT supported by senior members of DOI and the national NGO (who previously worked in a senior capacity in DOA) on the basis of their prior experience, observations made in the reconnaissance phase of the study, discussions with other programmes and agencies (see Appendix C for details of lessons learned from other projects).

It took some time to develop this outline, and it was not fully agreed until the first DL/AP was complete and WUS in progress. This gradual process was both inevitable and deliberate, as there have been many attempts at new ways of setting up WUAs in recent years, and too many of these have been unsuccessful – some degree of scepticism and critical appraisal of new ideas is both healthy and natural. If we were too prescriptive from the start we would be making the same mistakes that have caused previous attempts to fail.

Furthermore, the programme involved some innovative features, such as

- adaptation of concepts which had been successfully used in other sectors but which appeared to depend on certain features which were not applicable in the case of irrigation management (eg the practical aspects of insect identification in integrated pest management (IPM) schools which give those schools a very tangible and appealing focus);

- extending approaches used previously in the irrigation sector, particularly those promoted by FAO, but with a much greater emphasis on institution-building than on developing individual skills.

Even concepts which are well-established and documented, such as Participatory Rural Appraisal (PRA), have not been widely applied on large-scale irrigation anywhere and to a much lesser extent in Nepal. There appeared to be significant difficulties in using some of these techniques in a meaningful way. It was necessary to spend some time developing the skills and adapting the techniques to suit the local requirements before they could even be applied on the initial pilot projects. This is described in more detail in Section 3.2.

2.4 Selection of Sub-Projects

A shortlist of five (Table 2.1) was made from those considered in the Stage 1 study (Part 2A of this report, and shown on the map below) on the basis of eight criteria. The aim was to include schemes that: represent a range of management arrangements from fully agency managed to fully farmer managed, have an area over 500 ha in size, do not have an ongoing rehabilitation programme, provide more than supplementary irrigation to the farmers in the command, are likely to have farmers interested in cooperating with the study, indicate room for institutional improvement and/or can shed light on elements which are conducive to strong water management institutions, and indicate that the study team is unlikely to encounter security problems in the course of its work.

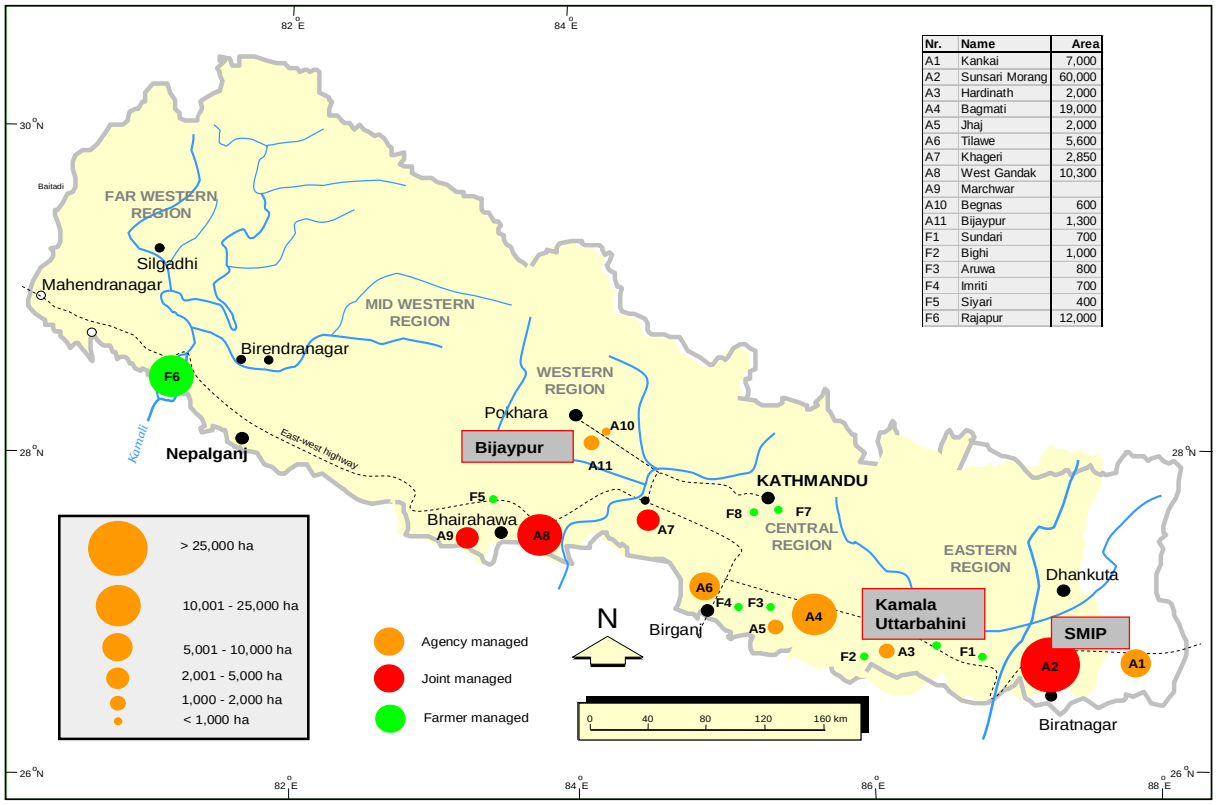
These schemes were revisited to verify their suitability against the selection criteria, and the following were selected: Sunsari Morang – Stage 2, Bijaypur, and Kamala Uttarbahini. Sunsari Morang – Stage 2 was an obvious choice since this is a joint managed scheme where diagnostic work has already been initiated at this site. Bijaypur is an agency-managed scheme which has various ecological, design and managerial features that make it representative of smaller hill schemes with operation and management problems that might be fruitfully addressed by this study. It is also facing important new challenges, as it is being influenced by urbanisation and there is a large social disparity between different groups of people. Kamala Uttarbahini is representative of a middle-sized FMIS which can offer lessons in relation to its institutional strengths as well as possible physical and institutional vulnerabilities.

Maps of these three projects are given in Appendix B.

Table 2.1: Shortlist of Schemes for Detailed Study

Name	District	Management
Bijaypur	Kaski	Small AMIS
Kankai	Jhapa	Medium AMIS/JM
Sunsari Morang - stage 2	Sunsari	Part of Large AMIS/JM
Kamala Uttarbahini	Siraha	FMIS with emerging conflict
Imriti	Bara	Sustainable FMIS

Figure 2.1: Project Location



Nr.	Name	Area
A1	Kankai	7,000
A2	Sunsari Morang	60,000
A3	Hardinath	2,000
A4	Bagmati	19,000
A5	Jhaj	2,000
A6	Tilawe	5,600
A7	Khageri	2,850
A8	West Gandak	10,300
A9	Marchwar	
A10	Begnas	600
A11	Bijaypur	1,300
F1	Sundari	700
F2	Bighi	1,000
F3	Aruwa	800
F4	Imriti	700
F5	Siyari	400
F6	Rajapur	12,000

3 Diagnostic Learning and Action Planning Process

3.1 Rationale and Objectives

The objective of the diagnostic learning and action planning (DL/AP) process was to:

- identify and involve all groups of stakeholders in the study; and
- collect sufficient information to establish a baseline of the characteristics of the area and develop and implement an action plan for the next stage of institutional development.

The DL/AP involved some data collection but that was not its primary objective: the process and who is involved in it were more important. There were opportunities for collection of more data, if needed, later during the WUS. A key feature was to explore how landless people, poor farmers and women were involved in the irrigation management and could participate effectively, as well as the more prominent stakeholders who normally control irrigation management.

DL/AP used well established PRA/PLA principles and techniques (such as those outlined in the IIED Participatory Methodology Series[7], the FAO SEAGA Guidelines[8] and the WB Participation Source Book[9]), with minor adaptation to suit the requirements of large scale irrigation in Nepal. The term DL/AP was coined in this project to avoid stereotyped application of methods used in earlier projects and also to stress the need to lead on to action. Although this is explicit in the distinction between PRA (participatory rural appraisal) and PLA (participatory learning and action), there was some local confusion because of alternative uses of the same sets of abbreviations. We have used the term DL/AP throughout the study.

3.2 Appropriate Field Techniques

(i) Development of the Approach for DL/AP

The field techniques were developed through a three stage process:

- The SImT carried out a DL/AP in one tertiary canal of SMIP (T3)
- The SImT carried out a second DL/AP in one branch canal of KUIS (B5)
- Terms of Reference were prepared on the basis of the findings of T3 and B5 for NGOs
- NGOs were recruited and oriented in the objectives of the project and the requirements of the DL/AP
- Separate NGOs carried out DL/AP in the rest of each sub-project.

Thus the techniques were gradually refined and improved. Each NGO was given a similar orientation and used similar techniques, but they applied them in slightly different ways depending on their past experience and varying views on participatory techniques as well as on the different situations in each sub-project, which made some techniques more or less appropriate or easy to apply.

[7] Pretty, JN, Guijt I, Scoones I, Thompson JN (1995) A Trainer's Guide for Participatory Learning and Action, IIED, London
[8] Jordans E (1998) SEAGA Sector Guide: Irrigation, FAO, Rome
[9] World Bank 1996

(ii) Formulation of Multidisciplinary Team

The team for the initial studies was as described in section 2.3, but it was later found possible to reduce this to a three-person multidisciplinary team consisting of water management specialist/irrigation engineer, sociologist/institutions/PLA specialist, and agronomist supported by local social mobilisers or field assistants. It is important that at least one team member has detailed experience of the techniques to be used, and that all team members are familiar with participatory approaches. They still needed some specific orientation and training, but an appropriate background is an important prerequisite for team selection.

Key selection criteria were:

- Appropriate mix of technical skills
- Familiar with participatory tools and techniques
- Proven knowledge of irrigation issues
- Enjoy working in a team
- Able to honour the knowledge, skills and experience of local people
- Knowledge of local language, local customs and tradition.

The SImT worked through the process gradually:

- First, through field exercises in Kathmandu, where a field exercise in Indrayani Irrigation System provided a lot of insights for improving the tools and techniques.
- Then, at SMIP adjacent to the study site, and
- Finally, through implementation of a DL/AP in SMIP and KUIS, with some support from the international team.

Thus they developed the techniques gradually and became familiar with the best ways to apply them. They found it necessary to adapt Many PRA tools and techniques, to make them better suited for a management of large-scale irrigation study. These then needed gradual testing and modification in appropriate locations.

Once the SImT had been through this process, they were in a good position to prepare Terms of Reference for local, district-based NGOs to carry out DL/APs in other areas. The NGOs all had some relevant expertise but lacked knowledge or experience of some aspects (in particular in the irrigation field). The criteria for selection of NGOs included experience in training for PRA/PLA, irrigation management, agriculture, institutional development and social mobilisation, other natural resource management, some experience of IPM/FFS. The experience of both the NGO and their nominated professional staff was considered.

In each case they needed to be given a good orientation in the objectives of the study and the methods that had been developed in the initial stages. This orientation was tailored to the specific needs of each NGO (bearing in mind their different backgrounds), but took the general form of one day of theoretical training and background, three days of field based training and then close backstopping for the initial period of DL/AP fieldwork.

In the case of SMIP and KUIS, the SImT undertook a full DL/AP in one sub-area, and thus developed strong local links which they were able to draw on when supporting the NGOs. In the case of BIP, the NGO was recruited after just a brief follow-up reconnaissance visit after completion of the Stage 1 studies to confirm the interest of the WUA in participating in the programme.

(iii) Courtesy Meetings with Line Agencies

Before starting fieldwork, the team visited related line agencies and local government to explain the overall objectives of the study and the plans for the intervention, in order to record their views, experiences, feedback and suggestions. These agencies are generally well aware of the irrigation scheme and its problems; they may have some related programmes in the same area. It is important that the DL/AP team is aware of their activities and vice versa: it is likely that the agencies will need to be involved directly or indirectly in any future programmes for strengthening the WUAs. This early contact was important for understanding each other's programmes and for building rapport.

(iv) Courtesy Meetings with the Community

The team first visited the WUA to explain the overall objectives of the study and the plans for the intervention, in order to records their views, feedback and suggestions. In accordance with the suggestions of the WUA, the team then organised several meetings with WUA officials and others to plan out the study in detail, including the decision on how to break down the project area into manageable and meaningful hydrological and social units for study (e.g. cluster-wise or branch-wise etc) – typically canal command areas were divided into three (head, middle and tail), but this depended on the size and composition of the canal and community. At the end, a general meeting was organised to explain the purpose of the study and the plans for implementation in detail to the wider community.

(v) Finalisation of Tools and Techniques

A relatively small number of PRA techniques were used in the first projects, but more were added as found necessary. Further refinement is now possible on the basis of the detailed field experience and this is discussed further in section 3.9.

The techniques were selected in order to help understand social characteristics, agriculture, irrigation infrastructure and management, and local institutions (including local customary practices in managing irrigation activities). These factors all had to be understood from the perspective of all different classes of stakeholders and in the context of system management and other agricultural support services.

Key techniques were identified as:

- Social and resource mapping to identify irrigation network, stakeholder groups and social infrastructure and resources
- Household profiles of local stakeholders, and indirect information on non-local stakeholders to build up an understanding of access to land
- Well-being analysis of water users / local stakeholders, to identify appropriate groups for Focus Group Discussions (FGDs) and detailed investigation of other issues
- Transect walk to verify the physical layout and problems
- Mobility map to understand issues related to migration, access to services and markets

- Time line to record ethno-history of area and development history
- Time trend analysis to record socio-economic changes over a certain interval of time
- Seasonal calendar to assess the existing cropping patterns, water scarcity period, times when credit needed, months with labour or food shortage, and other locally important seasonal information
- Venn diagrams to assess the institutional relationships
- Gendered Task Analysis to assess the work load of men and women
- Water Use Matrix to examine multiple use of water in various activities
- Key informant interview to gain detailed understanding of specific data from well-informed local people
- Focus group discussions to discuss varying perceptions of a range of key issues with groups according to well-being category, ethnicity, location or other characteristics
- SWOT analyses
- Problem Census and Problem Solving (PCPS) to identify major categories of problems with their resolution

Once the tools and checklists were prepared for the first time, they were tested close to the actual research side in order to familiarise the team with tools in the same cultural condition, and modify them in the feedback of the farmers.

As the techniques are novel (to most people) and enjoyable, there is a risk that they are done for their own sake and not used as a means for achieving the study objectives. For example Venn diagrams are a useful way of highlighting institutional arrangements, linkages and overlaps but they need to be accompanied by a discussion of the implications of those – for the benefit of both the users and the facilitators and, as far as is practicable, this needs to be documented in the DL/AP report.

(vi) Fieldwork

There were four stages to the fieldwork:

- Introductory visits,
- Large group discussions and activities,
- Small group meetings, and
- Feedback and verification meetings.

The introductory and feedback meetings are very important parts of the process and are essential for building rapport with the community.

Some techniques were used in large group meetings: these included social/resource mapping, household profile, well-being ranking, seasonal calendar, gendered task analysis, and Venn diagrams.

For other activities, small groups were set up to look at specific issues from the point of view of different social or interest groups. These groups were stratified in various ways according to the

objectives, but generally by well-being and gender. Techniques such as water use matrix, time line, time trend analysis, transect walk, and focus group discussions were used in these groups.

The local Social Mobilisers and field assistants helped to encourage local people to participate in these exercises and also gave valuable information themselves through their long experience in working and living in the system.

Social mobilisers were given an allowance roughly equivalent to the local agricultural labour rate, but other participants were not compensated except perhaps by provision of tea or light snacks. For this and other reasons it was important to keep the meetings as short and interesting as possible. Pictorial techniques were used wherever possible so that illiterate people could be involved in the process and understood what was being recorded. All observations were recorded on large sheets of paper, which were later given back to the community. Some secondary information (such as meeting minutes) was also collected during this field work, or from the WUA.

(vii) Feedback to the Community

At the end, all the reports produced in the field based on the tools were presented back to community in a general meeting for verification and triangulation of collected information. All information was displayed on large sheets of paper and explained to the participants: all were then invited to look at these and comment on or correct any information. This generally stimulated considerable interest as information about the community was presented in a consolidated yet easy to understand format.

Problem Census and Problem Solving (PCPS) techniques were then used so that different groups could identify the key problems, which were then ranked so that solutions could be identified. Strength, weakness, opportunities and threats (SWOT) exercises were carried out at this time. Following these exercises, an action plan for the next stage of the project was prepared.

3.3 Description of Tools Used

(i) General

The purpose of this section is not to repeat the general principles of PRA which are well described elsewhere (see references listed earlier), but to highlight features of particular relevance to this study. Two issues are worth stressing – the importance of ensuring that people fully understand the purpose of the study; and the need to be well-prepared before starting fieldwork. We adapted the techniques to suit the participants in each exercise; in some cases this meant paying particular attention to the needs of the illiterate (eg. use of pictures and symbols rather than text, and carefully reading them whatever was written). Other groups were more literate and greater flexibility in techniques was possible.

(ii) Social / Resource Mapping

Social and resource mapping is invaluable for understanding a community and its resource base. Maps are of fundamental importance for planning and managing irrigation, so they may already exist in some form (usually topographic or cadastral) but our purpose is to put the irrigation system into its social context. For this we need to involve local people in drawing a map which highlights important features of the village and its resources, and then use this map to discuss perceptions and problems. Key information includes canals, settlements, roads, other water sources, agricultural land, forests and pasture, markets etc.

Often people live away from the land they cultivate, but we need to include both settlements and land in the map. In some cases we found that most people lived locally, but a small number were resident in nearby towns yet farmed land themselves, others were tenants who lived in nearby villages, and a last group were completely absentee. Maps provide a good way of presenting the information, and understanding the complexities of involving these different groups of people.

The first stage in this is to get an overall understanding of the village layout, land irrigated and canal system, as there may be overlaps and complexities which need to be appreciated in advance. This is illustrated in the map overleaf. It is important also to understand if there are some areas which formally in the command area but in fact never receive water and are locally regarded as being out of command. Similarly there may be extra ‘unofficial’ irrigated areas.

After an introduction and explaining the purpose of the exercise, we asked the participants to start with drawing the prominent physical features in whatever materials they choose. It is important that they should draw the map themselves, and that everyone is encouraged to add what they want. As this was usually the first exercise that we did in a village, we invited a fairly informal group – we aimed to be as representative as possible but we did not purposively select people. The map helped us get an overall understanding, which we could clarify, confirm and supplement later through other exercises.

The motto of exercise is to involve local people in the process so that their knowledge, skills and ideas are recognised - they have an in-depth knowledge of their surroundings and usually enjoy presenting this in a visual way and discussing it.

After the mapping was complete, we asked some people randomly to identify their houses in the map, and make any amendments necessary. The houses were numbered to make it easy to present data on each household, which we did immediately after the mapping was complete *(see below*).

The facilitator observed the process very carefully and recorded any issues and concerns raised by the participants in the field diary without any interruption. We followed up on these issues through later discussions and exercises.

The main information recorded on maps included:

- Settlements and houses
- Canals, rivers, drains and other water sources
- Roads, bridges and other means of transport
- Areas of different land types
- Areas with specific problems, eg seasonal flooding
- Forests and grazing land (government, community, private)
- Temples and other community facilities or infrastructure.

(iii) Household Profiles

The mapping proved to be a good ice-breaker and helped us build rapport with the farmers. We followed it up by collecting basic data for the households identified through the mapping.

For the purposes of irrigation management, the hydrological unit (canal command area) is important, but this does not always correspond to the settlement pattern or socially coherent units which are important for forming users' organisations. If the settlement is small and entirely within the hydrological unit, it is better to prepare a social map on the basis of the hydrological unit but in the case of a big cluster, it is more appropriate to make a map on the basis of the social unit (village). So it

depends upon the situation of command area and settlements, but it is important to gain an understanding of both social and physical units. It is easiest to deal with not more than 45 households at this stage, so larger units should be subdivided.

Literacy by gender is very relevant for irrigation management. Female literacy is usually much lower than male, and this may influence their role and willingness or ability to participate in irrigation decision-making. As women are often disadvantaged in various ways, it is important to know the gender of the household head

Temporary migration or jobs away from the village is also important. It is usually practical to get information on the numbers of HH members who travel outside the village for other jobs – this can be explored later, but it is useful to get an idea of the importance of this issue at this stage.

A simple listing in the following format will summarise the basic information needed at this stage. It is important to include landless in this listing:

HH No	Household Head		Population		Education (number literate)		Number with jobs outside village	
	Name	Gender	Male	Female	Male	Female	Male	Female

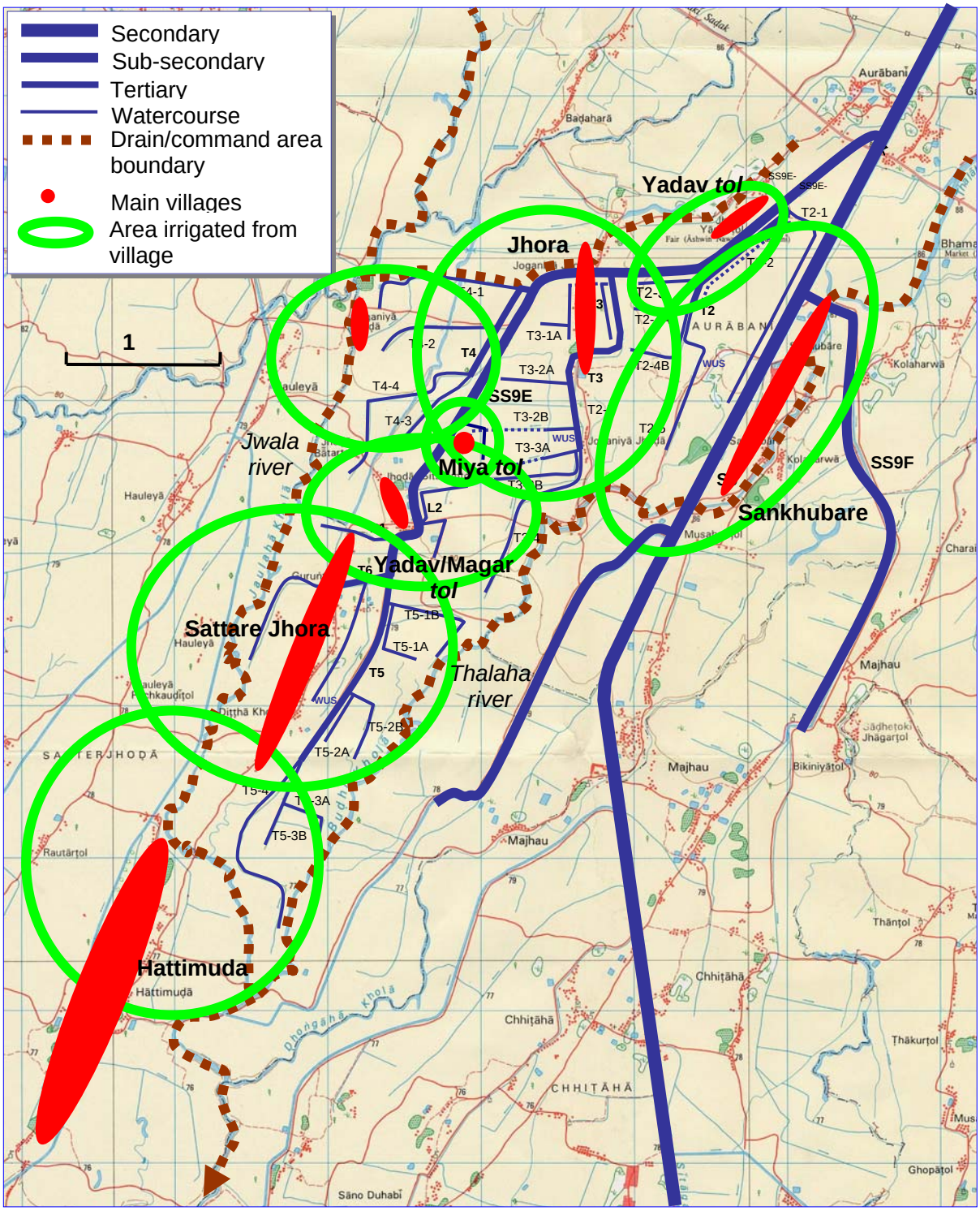
The next stage is to get some information on land holdings, but this is a sensitive topic and sometimes we used slightly different formats or approaches for collecting this information. We needed to know who the stakeholders were and what their relationships are, but did not try to collect full information on landownership as farmers are always afraid to provide information to the outsiders because of concerns related to land reform legislation. It will eventually be very important to get exact data on land holding size and tenure but this can be collected after some time once the outsiders have some knowledge about the area and have a good working relation with local people.

At this stage it is important to list all the stakeholders – including absentee farmers, short-term sharecroppers, landless and non-local sharecroppers. These people tended to be ignored when we spoke to villagers initially. We can at least list them in crude terms as “sharecropper of farmer X”, even if people do not know his/her name.

We need to be careful to avoid double counting information by recording information about the same land under both the landowner’s and tenant’s name. The maps are useful for keeping track of this.

The following formats are useful for summarising the information. If areas cannot be obtained, a yes/no answer for each category is sufficient.

SMIP – SS9E
Overview of villages and land irrigated



Farmer's name	Owner's name (if different)	Sharecropper *(bataiya/adhiya)*		Contract (*theka*)		Mortgage (*bandaki*)		Land outside this canal	
		giver	taker	giver	taker	giver	taker	In this system	Else-where

The exact format required depends on the type of tenure common in the area. In our case, registered tenants are extremely rare and it was not important to distinguish them from landowners since they have a formal long-term right to land and are fully eligible to participate in WUA activities.

(iv) Well-being Ranking

Once we had identified the stakeholders, we needed to group them to make sure that we involved all different groups in our study and in any subsequent arrangements for irrigation management. The process we adopted was one of well-being ranking. In this we asked people how they judged which households in the village were more or less well-off, and then asked them to classify the stakeholders on this basis. It helps to understand people's views on socio-economic condition and differences between the households and to explore issues related to livelihood and vulnerability.

This is another sensitive but important exercise, which needs to be done very carefully. It is essential to start with a good introduction of its purpose (and make sure that people do not relate it in any way to tax collection).

Well-being categories
(as defined by tail-end stakeholders on KUIS branch 5)

Very poor:	Landless	*Poor*:	Landholding-less than 6 *katha*
	Uneducated		Sharecropper
	House on *ailani* land		small house on own land
	Agricultural labourer		food secure 4-5 months
	No livestock		own hand pump
Medium:	land up to 1 bigha	*Well-off*:	Own farm
	Sharecropper		Laborious in farmer
	Laborious		less land than highly well-off

Very well off:
- Large landholding
- Son has a shop
- Government job holder
- Educated
- Food secure for whole year

First we prepared five cards labelled highly well-off, well-off, medium, poor and vulnerable in large letters, placed them in a row and asked people what factors they took into account when considering whether people were rich or poor. Then we prepared small cards with the name of the household head (from the social mapping and profiles), and encouraged people to put each name card under one of the five well-being categories of cards.

After all the cards had been placed, we asked them to check whether the order of cards was appropriate, and we provided opportunities to discuss this and rearrange the cards. We gave all people including poor and illiterate people the chance to express their views, and then we recorded the consensus of the well-being category for each household. We also recorded the issues and concerns raised and discussed by the participants during the exercise.

Well-being is culture specific and is difficult to assess. So the facilitator should have some basic knowledge about the people and their culture – we used locally based NGOs as there are many cultural differences and potential misunderstandings even within the country. The definitions of the categories varied from village to village. The box above gives examples of the categories from one village. Typical indicators which people used were land ownership/sharecropping, months per year of food security, size and type of house, government job, agricultural skills and diligence, dependence on working as an agricultural labourer, health, access to drinking water. Although there is usually a close relation between well-being category and land ownership, it is not always the case and we encountered well-off but landless people and conversely poor people who owned some land.

Absentee farmers cannot usually participate in the well-being ranking, but some who live nearby may be involved. However, other members of the community can judge their status and we can check this assessment with other secondary information with the indicators already set by farmers. It makes subsequent use of information and analysis much easier, and reduces the risk of errors if the well-being ranking is transcribed onto the HH listing.

Well-being category	HHs number	Total HHs (%)	Indicators	Remarks
Well-off				
Medium				
Poor				
Vulnerable				

(v) Transect Walks and Maps

Transect walks help in understanding different agro-ecological zones; physical features (canal infrastructure); topography, land type and usage; etc. Such information is very important for analysing the dynamics of an irrigation system. If it is done in the beginning then it will help for social and resource mapping, but it may be necessary to do a further walk later to help understand the problems and issues that are raised in the various exercises. A group of five or six knowledgeable farmers is appropriate, preferably from different parts of the canal command.

Our initial transect paths were along canals or outlet channels, but we deviated from the line in order to observe conditions away from the channel, and in subsequent walks in the same area we also walked across command areas. It is important to observe conditions along the full length of the walk, and not just the specific interests of the participants. Information from the walks was added to the resource maps, although it would also be useful to prepare specific maps for each transect walk.

Issues that we observed, included

- Layout and condition of canal and structures
- Type of structures (official and unofficial), and the way they are operated
- Responsibilities for and quality of maintenance – all along the canal
- Soil types and crops
- Land holding locations (in outline)
- Field irrigation practices
- Areas easy or difficult to irrigate
- Drainage or flooding problems
- Other uses of canals
- Access arrangements and problems.

(vi) Mobility Map

This gives a general picture of the mobility of people for various tasks such as education, health, economic activities (including daily labour, seasonal migrations, etc), marriage, as well as for specific activities related to irrigation (obtaining water, maintaining the canal, and resolving disputes etc.)

First, each purpose for travel was listed on a card. Then, taking one aspect at a time people were asked where they went to get the service (from nearest to farthest) with reasons (for example - if there is irrigation related conflict then where do farmers go first, then where, then where, with reasons).

This was done in a small group, but the different locations or reasons for various groups of people travelling were carefully recorded (some people would go to the WUA to resolve a dispute, others might go to a local or national politician).

(vii) Time Line

It is very easy for an outsider to get a static view of an irrigation system, but the reality is that there are many changes in the irrigation system or in the village which affect the way the system is managed. The purpose of this exercise is to understand the development of the area in a systematic way – including

- History of the village and immigration
- History of the development of the system
- Major events in agricultural development – introduction of new crops

- Major events (droughts, floods)
- Introduction of community forestry
- Construction of roads, provision of electricity etc.

This was done with a small number of old and other knowledgeable people who have lived in the areas for many years. The major events are then listed in chronological order. This information is validated through discussions with other people during other aspects of the study.

Year	Major events (in chronological order)
1995	
1996	
1997	

(viii) Trend Analysis

This tool is used to explore changes over time in irrigation facilities, agricultural inputs, extension service, market demand and access, yields, crop diseases, population, etc. First the list of items to be discussed was decided and listed in a matrix on the ground in chalk. The basic list of issues was decided in advance but the participants were invited to add other topics if they felt them relevant. The participants were then asked about changes in each item, with reasons, over the past ten years (other time periods could be chosen, but this was an appropriate timescale for this study). For this reason it was important to choose a small group of people who were collectively knowledgeable of all aspects of the area and who had all lived there for more that 10 years.

Activities	Value/status/change		Reasons for change/(s)
	1994	2004	
Irrigation facilities			
Availability of water			
Conflicts over water			
Payments for water			
Crop areas Rice Wheat Maize etc			
Crop yield Rice Wheat Maize etc			
Crop diseases/pests			
Agricultural inputs/extension			
Production Cost			
Price of commodity			
Access to the market			
Availability of pasture/forest			
Livestock type/numbers			

(ix) Seasonal Calendar

Seasonal influences have an important impact on the way irrigation is managed and on the livelihoods of local people. A seasonal calendar is thus useful for understanding local perceptions of seasonal variations – such as crop patterns, water availability, canal maintenance, periods of heavy workload, diseases, food security, employment opportunity etc. It is also used to identify periods when different types of intervention are most required.

Item	Months											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Major crops												
Paddy												
Wheat												
Maize												
Pulses												
Busy time												
Off-farm labour												
Loan required												
Crop disease												
Canal Maintenance												
Water scarcity												
Water surplus												
Food deficit												
Illness of children												
Festivals												

There may be significant differences between different groups of people. Poor people may grow different crops from richer farmers or they may grow them at slightly different times; or they may face greater water shortage or have longer food deficit periods. If necessary extra lines were inserted to ensure that these differences were captured.

(x) Venn Diagram

Venn diagrams are a useful way of elucidating relationships (whether direct or indirect) between the various institutions. They help project stakeholders to reflect on the nature of coordination between the local community and other organisations. First we collected basic information of various institutions available in the area, and then prepared circles of card of various sizes, which we asked the participants to allocate to different institutions so that the largest circle is assigned to the most important institution and so on. We then asked the participants to arrange the circles to show the degree of contact between institutions or groups. The distance between the circles indicates the relationship between organisations and overlapping of circles denotes coordination.

Then participants were asked to place one way arrows and two way arrows to indicate whether there is a one way or two way relationship between the institutions.

These concepts may be a little unfamiliar and we found that the facilitator needed to explain the ideas very carefully and guide the selection and placing of the circles. There may be a large number of institutions; it is useful to have a basic understanding of the key institutions in advance.

Name of Organisation	Date of est.	Sector of the Activities				Activities
		Educ.	Social	Econ.	Agric.	

(xi) Task Analysis by Gender

This tool was used to collect information, raise awareness and understand how household and community tasks are distributed according to gender. We prepared for this exercise by preparing cards with various tasks related specifically to irrigation and other relevant activities and then asked the participants to sort out the cards by categorising them under three large drawings in columns, according to whether the task is generally performed by a man, a woman or both. Some cards were left blank for the participants to add in extra topics that they felt were important. We asked who is actually involved in each task, whether there are any changes in gender division of labour and the causes behind this.

Activities	Male	Female	Both
Agriculture			
Selection of seed			
Preparation of land			
Seed bed preparation			
Transplantation			
Water application			
Weeding			
Fertiliser application			
Harvesting			
Marketing/selling			
Irrigation			
Canal maintenance			
WUA meetings			
Decisions regarding irrigation			
Monitoring canal flows			
Guarding/diverting water			
Household activities			

It is important that the participation of male and female should be equal, and where possible male and female members of the same household should be present. It may be necessary to do this exercise separately for different well-being and caste groups – there are significant differences, for example between hill and *tarai* groups.

(xii) Water Use Matrix

Canals and other water sources are used for a variety of purposes by different groups. It is important to understand who uses them for what purposes and what impact this has on others. A similar approach was used for the task analysis – the matrix was labelled pictorially, and participants distribute stones to indicate which water source they draw water for each water use (more stones equal more importance for that particular use). Where there were differences between socio-economic groups we added in additional lines in the matrix to distinguish them.

This also provided an opportunity for a wider discussion regarding issues such as: what are the major water sources in the area? How can water be used for various purposes? Which source of water is best for irrigation and domestic purposes? Do all socio-economic groups have equal access to water? How can water availability can be improved?

Water Source/Use	Rain	River	Hand Pump	Well	Canal	Tap Stand	Other
Field Crops Winter Spring Monsoon							
Kitchen Gardens							
Livestock							
Drinking							
Washing							
Bathing							
Fishponds							
Worshipping							

(xiii) Key Informant Interviews

Key informant interviews are useful for getting descriptive information on the basis of past and present experiences from key irrigation officials, social leaders of the community and other individuals. The list of key informants was drawn up in the consultation with local people on the basis of role, function or special insights and substantive knowledge of the issues to be discussed. The discussion was kept brief and informal, so the checklist of key topics needs to be carefully drawn up.

(xiv) Focus Group Discussion (FGD)

FGDs were important for getting specific information from each well-being category – it was thus the central tool for understanding differing views and opinions, and verifying information collected from use of other tools and techniques. The group size should be around 7-12 and they should all be from the same well-being

category. In some cases separate groups for women are useful.

It is best if a second person can take notes of the discussion, leaving the facilitator free to lead the discussion in a free and interesting manner. At the end, the discussion should be summarised and presented back to the participants for verification, addition or deletion.

(xv) Problem Census and Problem Solving (PCPS)

This tool was used to assess and rank the types of problems perceived by the participants. This was done in a large group, but once the list of problems had been prepared, they were divided into small groups by well-being and gender to rank the problems.

The participants were asked to select three top priority problems for a detailed discussion on their cause and effects; each group was then requested to present their conclusions, explain what they currently do to cope with these problems, and recommend strategies for solving the problems.

Problems	*Causes*	*Coping Strategies*	*Strategies for solving*

Participants will generally have some expectations or aspirations for external help, but our purpose was to help them to solve problems themselves. This needed careful facilitation to avoid them presenting a shopping list of problems. We first had to make the purpose of the exercise very clear to the participants.

3.4 Practical Problems in the Field

Although the techniques are not in themselves new there are may difficulties in applying them in the field particularly in the context of large scale irrigation:

- It is not possible to involve all people during the familiarisation meeting to share the rationale and modality of the study. Due to this, the DL/AP team have to share the same information a number of times with various people in various locations.
- Information is sometimes influenced by various group interests, so different tools were used to check and verify similar types of data from different sources and viewpoints.
- Initial suspicion based on dissatisfaction with traditional methods used in earlier programmes (where data was collected and used by outsiders only).
- Well-being ranking is essential but sensitive and creates some misunderstanding among the users unless done very carefully – skilled and experienced facilitators are essential.

- It is difficult to avoid the dominance of elite and literate people in every discussion, who overrule and discourage others. Women and poor/landless are not considered as key informants by elites.
- Suspicions on both sides (outsider team and the community) making it difficult to build rapport with the community within a short time.
- It seems a very long drawn out process but it is important to get a good understanding and develop effective relations with the community.
- The participation of farmers may be low during peak agricultural time.
- Some farmers are curious and others are against the study. Different people have different interests. Some farmers were worried that they may need to pay more Irrigation Service Fee (ISF) and labour based on land size.
- Social, administrative, topographical and hydrological boundaries rarely match, so social and resource mapping and preparation of stakeholder lists is very difficult. There may be several landowners in one household.
- Land tenure patterns are often complex and people are reluctant to give reliable data. They may be suspicious of the motives for collecting data and they may be concerned about the legal implications of tenancy arrangements.
- Farmers are often more concerned with attracting investment for infrastructure than with institutional development, particularly in the early stages of the study. This is a particular problem when discussing the problems which they face with the infrastructure.

3.5 Practical Solutions

These difficulties could easily undermine the whole approach so it was important to take very careful account of them, and adopt a flexible approach whilst remembering the overall objectives of the study:

- There should first be a transect walk with key informants to become familiar with the local context as well as the boundaries of the social and hydrological units – it may be necessary to do further or more detailed transects, and possibly with other stakeholders.
- There are a wide range of different tools which can be used with different groups to cross check information. If the same techniques are used with all groups, it can get repetitive and participants will get bored.
- Sensitive issues such as well-being should not be investigated until after the transect walk and mapping to allow time to build up trust with the community, and to clarify the purpose of the ranking (eg that it is not going to be used for ISF assessments, etc.).
- Well-being ranking needs particular care, but the participants get some ownership of the well-being exercise by identifying their own indicators (rather than using a ready-made format of indicators).
- Land ownership data is sensitive, so it is better to concentrate initially on identifying the stakeholders according to land tenure and well-being status, without being too concerned about actual land areas. It is more important to identify all categories of users, than to collect all details of each individual - further details can be collected later once the team has been able to build better rapport with people, or even later by the WUA itself once they recognise and accept the need for this.
- Other household data is usually less sensitive, but it can become tedious if too many variables are collected in the household profiles – people can lose their enthusiasm if this process becomes too lengthy.

- Generally people found the participatory tools simple and enjoyable, so they were happy to take part, and the overall approach to DL/AP made the participants feel involved and respected.
- Sometimes too many people want to join the transect walk. This can hamper progress by making it difficult to talk meaningfully and the main transect walk should be done with a small number of knowledgeable key informants. Sometimes it is useful to look at specific problems with different groups.

In all, the DL/AP process was liked by farmers as they were entirely involved in the whole process and remained enthusiastic throughout and they did not feel the frustration that they had with past more 'extractive studies', although it still requires skill and sensitivity to retain their interest throughout the process.

It is always important to remember that the tools are a means to an end – for involving people and finding out information. It is not the map itself, for example, that is important but the way that preparing the map involves local people, makes them feel that their knowledge is respected and important, and helps in building our understanding of the system.

3.6 Extent of Detail Needed

The DL/AP was not meant to be a comprehensive baseline survey, as there were more specific objectives for engaging the participants (to ensure meaningful participation) and planning the next stage of intervention (in this case a water users' school). In other cases some other intervention might be required but the objective of the DL/AP would still be to develop an action plan addressing all issues and concerns for this activity.

The detail in the information collected should reflect this need: more information can be collected later, if necessary. For example household data can be amplified and verified later once the WUA realises the need for an accurate farmer inventory for their own management purposes.

3.7 Action Plans

The final output from the DL/AP is an action plan agreed with the community. In this case, it took the form of a preliminary list of topics for inclusion in the WUS. It was not a final, detailed curriculum, as there was still time to modify this during the implementation of the WUS, but it was an outline in sufficient detail to award a contract for managing the WUS.

Different parts of the same project may have slightly different requirements but with a lot of overlap, whereas other projects may face completely different problems. For this reason, it is not necessary to prepare separate action plans for each DL/AP sub-area, but these areas can be grouped together and a single action plan prepared for the whole project or relatively large subdivision. The exact grouping can be decided during the DL/AP but is constrained by the diversity of problems and the practical size of groups for doing a PCPS in a meaningful way. For preliminary planning it is suggested that it should be done at the level of tertiary canal in SMIP (ie for a group of three to four DL/AP sub-areas).

This ensures that the stakeholders can have a real input into planning without the process becoming too drawn out and repetitive.

3.8 Reporting

A DL/AP report was needed but this was intended to be a concise summary of the findings, presented in a way that is useful for planning the WUS. It will also be a useful reference document for the WUA.

It needed to be prepared quickly and in a simple, well-structured, but standard format to summarise the data and include some simple analysis. It was designed before the field work - this helped to ensure that all required information was collected and could be analysed and presented clearly. As the report was prepared by a local NGO neither sophisticated analyses nor elaborate reports were expected. The report should be made available to the community (in their language).

The DL/AP also enabled a baseline of the characteristics of the system and its institution to be prepared. A standard matrix was prepared for this to enable comparison between schemes (Appendix E), but for the purposes of self-monitoring by the WUA the participants in the WUS were encouraged to develop and use their own indicators (see section 4.3.3)

3.9 Outline Plan for DL/AP

(i) Steps for DL/AP

A plan for carrying out a DL/AP in a typical area of 500 ha has been prepared. This assumes that the area can be divided into three areas for water users' schools (± 150-200 ha) and each of these can be divided into three sub-areas for DL/AP (±50-70 ha). The process involves:

- Initial meetings and rapport building with WUA in first WUS area
- Large group work in first sub-area
- Small group work in first sub-area
- Feedback and verification in first sub-area
- Repeat same process in second and third sub-areas
- Development of action plan with first WUS area
- Repeat same process for second and third WUS areas
- Finalisation of report for whole area
- Final feedback and presentation of report

It is recommended that all this work will be done by a locally based NGO. Depending on their skills and prior experience they will need a varying degree of support for field based orientation and technical backstopping. This is likely to be fairly intensive for the first sub-areas and less so for later areas.

(ii) Detailed Timetable for Fieldwork

The detailed timetable will be worked out at the time of the initial meetings to suit the local situation but is likely to include:

- Four days field work per sub-area (±50-70 ha).
    - Day 1: familiarisation – community meetings, initial transect walks and confirmation of basic unit, serving 50 – 100 households or 60 ha
    - Day 2: large group: transect/social mapping, stakeholder identification, and well-being ranking
    - Day 3 & 4: small group activities (seasonal calendar, Venn diagram, trend analysis, time line, task analysis, mobility mapping, water use matrix, FGD, etc)
- Two days analysis, feedback, reporting per sub-area

- Two days per group of three sub-areas: synthesis, PCPS, Action Planning (for WUS or other programme)

(iii) Report Format

The report format used in the study is given in Appendix D. This could be refined and simplified but it is important to include details of variations between people or parts of the system, without being repetitive – much of the value of the report is in highlighting the differences.

(iv) Programme

A tentative programme and budget is included in Figure 3.1. This is based on times and unit rates from the present study: it is possible that these could be reduced, but it is important that the fundamental participatory principles are not compromised. This means that sufficient time must be allowed at all stages – rushing the process may completely undermine it.

Figure 3.1

Typical DL/AP Programme and Inputs for 500 ha Command Area

No.	Activity	Team (as labelled on chart)
1	**Planning**	
1.1	PLA Team Meeting	
1.2	Field orientation	
1.3	Secondary data collection	
1.4	Field work planning (methods, checklists, etc)	
2	**Implementation**	
2.1	**WUS Area 1**	
2.1.1	Introductory meeting	
2.1.2	WUS 1 : Sub-area 1	Team 1 +2
2.1.2.1	Household profile/map/ranking	
2.1.2.2	system overview (transect/map)	
2.1.2.3	Agriculture overview (transect/map/fgd)	
2.1.2.4	Social overview (mobility/venn/task)	
2.1.2.5	Focus groups	
2.1.2.6	synthesis	
2.1.2.7	feedback meeting	
2.1.3	WUS 1 : Sub-area 2	Team 1
2.1.4	WUS 1 : Sub-area 3	Team 2
2.1.5	Action planning for WUS 1	
2.1.5.1	synthesis of sub-area action plans	Team 1+2
2.1.5.2	feedback and WUS planning meeting	Team 2
2.2	**WUS Area 2**	
2.2.1	Introductory meeting	Team 1
2.2.2	WUS 2 : Sub-area 1	Team 1
2.2.3	WUS 2 : Sub-area 2	Team 2
2.2.4	WUS 2 : Sub-area 3	Team 1
2.2.5	Action planning for WUS 2	Team 1 (+ 2 for synthesis day)
2.2	**WUS Area 3**	
2.2.1	Introductory meeting	Team 2
2.2.2	WUS 2 : Sub-area 1	Team 2
2.2.3	WUS 2 : Sub-area 2	Team 1
2.2.4	WUS 2 : Sub-area 3	Team 2
2.2.5	Action planning for WUS 2	Team 2 (+ 1 for synthesis day)
3	**Reporting**	

Inputs – Week 1 to Week 3

No.	Item	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	**Staff**																					
1.1	Engineer x 2	2	2	2	2	2	2		2	2	2	2	2	2		2	2	2	2	2	2	
1.2	Agriculturist x 2	2	2	2	2	2	2		2	2	2	2	2	2		2	2	2	2	2	2	
1.3	Sociologist/Institutions specialist x 2	2	2	2	2	2	2		2	2	2	2	2	2		2	2	2	2	2	2	
1.5	Field Assistant								3	3	3	3		3		6	6	6	6		6	
1.6	Secretarial support																					
	Expenses																					
2.1	Vehicle		1				1		1	1	1	1		1		2	2	2	2		2	
2.2	Stationery																					
2.3	refreshments								1	1	1	1		1		2	2	2	2		2	
2.4	misc costs																					

Inputs – Week 4 to Week 6

No.	Item	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
1	**Staff**																					
1.1	Engineer x 2	2	2	2	2	2	2		2	2	2	2	6	2		2	2	2	2	2	2	
1.2	Agriculturist x 2	2	2	2	2	2	2		2	2	2	2	6	2		2	2	2	2	2	2	
1.3	Sociologist/Institutions specialist x 2	2	2	2	2	2	2		2	2	2	2	6	2		2	2	2	2	2	2	
1.5	Field Assistant		9	6	6	6	6			6	6	6	6	6		3	3		12	6	6	
1.6	Secretarial support																					
	Expenses																					
2.1	Vehicle		2	2	2	2	2			2	2	2	2	2		1	1	1	2	2	2	
2.2	Stationery																					
2.3	refreshments		2	2	2	2	2			2	2	2	2	2		1	1	1	2	2	2	
2.4	misc costs																					

Inputs – Week 7 to Week 9 and totals

No.	Item	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	Contin-gency	Qty	Rate	Total
1	**Staff**																									
1.1	Engineer x 2	2	2	2	2	2	1		2	2	2	2	2	2		1	1	1	1	1	1		5	110	1,500	165,000
1.2	Agriculturist x 2	2	2	2	2	2	1		2	2	2	2	2	2		1	1	1	1	1	1		5	110	1,500	165,000
1.3	Sociologist/Institutions specialist x 2	2	2	2	2	2	1		2	2	2	2	2	2		1	1	1	1	1	1		5	110	1,500	165,000
1.5	Field Assistant	6	6		6		9																5	170	250	42,500
1.6	Secretarial support								2	2	2	2	2	2		1	1	1	1	1	1		2	20	500	10,000
	Expenses																									
2.1	Vehicle	2	2		2		2																	54	1,800	97,200
2.2	Stationery																									30,000
2.3	refreshments	2	2		2		2																	52	250	13,000
2.4	misc costs																									10,000

sub-total		**697,700**
contingencies	10%	69,770
Tax deducted at source	15%	82,125
Overheads	10%	84,960
VAT	10%	93,455
GRAND TOTAL		**1,028,010**
		13,707
Cost/ha	NRs	**2,056**
	US $	**27**

4 Water Users' Schools

4.1 Introduction

4.1.1 Objectives

Water Users' Schools were envisaged as an entry point activity for involving local stakeholders in improving management and governance of the irrigation system. More specifically they were expected to:

- Increase the practical knowledge of users in sustainable irrigation management, by helping them to identify and solve problems themselves
- Help users and WUAs to identify and introduce practical measures to promote good governance in the WUA and their sub groups
- Increase participation of vulnerable stakeholders such as female-headed households and landless farmers in irrigation management
- Encourage links between water users and WUAs and other local institutions and agencies
- Make users more aware of the role of Government, and the relevant policies, legislation, rules and regulations regarding water management.

It should be stressed that they were intended to strengthen the WUAs and not to work as a substitute for them. They would only be run for a short period, perhaps one or two seasons, and help the WUA to work effectively and in the interests of all stakeholders. This accounts for intensive nature of the WUS and does not imply that the WUAs will need to continue to work on the same basis once the WUS are complete.

4.1.2 Concept of Water Users' Schools

The concept of a water users' school is not a new one, but it has been adapted from the farmers' field school approach with some key modifications for this project. The fundamental approach is one of learning by doing. This has previously been used on integrated pest management schools (1995 onwards), and later adapted to irrigation through the on-farm water management (OFWM, in 1997) and integrated crop and water management (ICWM, in 2002) programmes, as described in section 1. These all aimed at developing skills amongst the farmers, through an effective programme of transfer of knowledge, using adult learning techniques.

The WUS in this project differed in some key respects from previous FFS. They

- Were planned on the basis of the DL/AP studies in each project, so that the approach and curriculum was tailored to local needs
- Include group activities (for institutional development, management of canals etc)
- Aimed to enable participants to identify, understand and solve problems, not teach them solutions – the WUS is based on the concept of problem identification and solving, rather than transfer of knowledge
- Required purposive selection of participants to ensure representation of all stakeholder groups

- Specifically aimed to disseminate knowledge and findings to non-participants, using the concept of Minor Schools (see Section 4.2.4)
- The Minor Schools were also designed to ensure a cyclic learning process.

These features are described in more detail in later sections.

The "catchment" for each WUS was a sub-unit within the sub-project irrigation system identified during the DL/AP, and the WUS provides a forum for weekly meetings in the field, to solve problems as they occur. It ensured a basis for free discussion of the issues and enabled the stakeholders to get to know each other better and understand the problems in a non-threatening environment. Field activities were chosen so that the participants learn about the most important features of their system and are helped to understand and solve problems about these.

Although the emphasis was on the participants working together to solve problems of managing the whole unit, rather than to learn individual skills, some agricultural sessions and a demonstration plot are included so that they could learn agricultural techniques.

4.1.3 Numbers of Schools Run during this Project

A total of ten Major Schools and thirty-four Minor Schools (see Section 4.2.4) were run during this project; this is equivalent to about 22,000 person-days, and about 1,100 people were directly involved.

Table 4.1: Number of Water Users' Schools

Location	Major	Minor 1	Minor 2	Minor 3	Minor 4
Spring season (February-June) [18 weeks]					
SMIP	SS9E/T3	SS9E/T3-1	SS9E/T3-2	SS9E/T3-3	SS9E/T3-4
KUIS	B5	Head	Mid	Tail	
Monsoon season (June-November) [21-24 weeks]					
SMIP	SS9E/T2	SS9E/T2-1	SS9E/T2-2	SS9E/T2-4	SS9E/T2-5
	SS9E/T3	SS9E/T3-1	SS9E/T3-2	SS9E/T3-3	SS9E/T3-4
	SS9E/T5	SS9E/T5-1	SS9E/T5-2	SS9E/T5-3	SS9E/T5-4
KUIS	B1-4	Head	Mid	Tail	
	B5-6	Head	Mid	Tail	
	B7-10	Head	Mid	Tail	
BIP	B3	Head	Mid	Tail	
	B4	Head	Mid	Tail	

4.2 Design

4.2.1 Curriculum/Themes

The curriculum was structured around three themes: institutional development, water management (including maintenance of any infrastructure required) and agriculture. Greater attention was given to institutional development and water management rather than to agricultural techniques. This reflects the objective of good governance of irrigation systems in this project.

Table 4.2: WUS Curriculum: Special Topic Sessions

Theme	Number of sessions per theme
Institutional Development	9
Water Management	5
Agriculture	3
Sub-total	**17**
Introduction	1
Post-Evaluation	1
Review and Closing	1
TOTAL	**20**

Within each theme, a range of special topics were covered. These special topics were identified on the basis of the priority problem areas and issues which arose in the course of the Diagnostic Learning/Action Planning (DL/AP) process, which was conducted in each WUS "catchment" area during the winter or spring season.

Many participants had great interest in learning about many agricultural issues but this was largely out of the scope of this school. Agricultural topics that were covered included those which are specifically relevant to irrigation management, such as seasonal crop planning and on-farm water management. However, because of the participants' keen interest in the agricultural content of the school every session included about one hour for observation of the demonstration plot and brief discussion of agricultural issues as they were observed in the demonstration plot towards the end of each session.

The detailed content for each WUS was adjusted to the specific conditions in its catchment area (e.g. position in head, middle or tail of the irrigation system, particular operation and maintenance issues, drainage issues, agro-ecological conditions, etc.). Guidance for this adaptation came partly from the DL/AP, but mainly from ongoing feedback from the participants. The WUS sub-project manager worked with the Resource Persons/Subject Matter Specialists (RP/SMS) to ensure that the detailed content of each session was tailored to the particular circumstances and interests of participants in each WUS.

The programme for the schools varied slightly for each sub-project. A typical programme and budget is given in Figure 4.1.

4.2.2 Participant Selection

Selection criteria were agreed at the end of the DL/AP stage with the Water Users' Group in each sub-project area who were then asked to select participants accordingly. From the experience gained in the

first schools, in Spring 2003, it was apparent that interest, self-motivation, and likely influence in their households and on others in their socio-economic category are particularly important criteria.

However, this was not sufficient to ensure that the participants represented stakeholder groups. In view of the need to maximise benefits to livelihoods, we needed to put in special effort to encourage participation by poor and marginalised people, particularly landless and women.

We also needed to recognise social dynamics within households – in the spring schools a disproportionate number of people who are not decision makers in households with regard to irrigated agriculture were included. Heads of households tended to send younger members of the family and were not always receptive to the ideas that they learnt. One reason they did this was because such people were more likely to be literate – even though we stressed that literacy was not a pre-requisite for the school.

The criteria adopted are listed below.

Table: 4.2 Selection Criteria for WUS Participants (Monsoon 2003)

Criteria	Requirement
Total Number	25 to 30 participants
General Personal Characteristics	Interested, self-motivated, respected, committed to participate in the school for the full duration of the WUS, active in farming/agriculture, willing to disseminate what they learn
WUO Office Bearer	between 6 – 9 out of the total number of participants; they should make up no more than 1/3 of the total number of participants
Position on Branch /Tertiary canal	number of participants from each cluster should be proportional to the number of households in each cluster.
Age	aged between 22 – 60 years
Ethnic Group	number of participants from each ethnic group should be proportional to the ethnic distribution of households in each grouping by cluster
Women	minimum 10 women participants in each WUS, with number proportionate by cluster and well-being category
Well-being Category	Representation proportionate to number in each well-being category.

There was some difficulty in meeting the criteria, but we managed to achieve a broad compliance with them albeit with a slight bias towards the middle strata. This is not surprising as they have the dominant interest in irrigation; this meant that there was a slight under-representation by the very poor, which we had to rectify during the season. There was also a slight bias towards the literate, even though we stressed that illiterate people were equally welcome – we did not want to exclude any because of their literacy. Some ethnic groups were slightly over-represented (either due to their interest, such as Tharus at SMIP, or because of their dominant role in society, such as Gurungs at BIP) while others were under -represented (notably the Kumals at BIP).

Figure 4.1 (page 1)

Typical DL/AP Programme and Inputs for 500 ha Command Area

		Week -2							Week -1							Week 1							Week 2							Week 3							Week 4							Week 5							Week 6							Week 7							Week 8							Week 9						
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
1	**Planning**																																																																											
1.1	WUS Team Meeting																																																																											
1.2	Introductory meeting																																																																											
1.3	Site/Participant selection																																																																											
1.4	Curriculum planning																																																																											
1.5	Follow-up meeting																																																																											
2	**Implementation**																																																																											
2.1	Session 1																																																																											
2.2.1	Session planning																																																																											
2.2.2	Major school 1																																																																											
2.2.3	Minor school (x 3)																																																																											
2.2.4	Major school 2																																																																											
2.2.5	Minor school (x 3)																																																																											
2.2.6	Major school 3																																																																											
2.2.7	Minor school (x 3)																																																																											
2.2.8	Review																																																																											
2.3	Session 2																																																																											
2.4	Session 3																																																																											
2.5	Session 4																																																																											
2.6	Session 5																																																																											
2.7	Session 6																																																																											
2.8	Session 7																																																																											
2.9	Session 8																																																																											
2.10	Session 9																																																																											
2.11	Session 10																																																																											
2.12	Session 11																																																																											
2.13	Session 12																																																																											
2.14	Session 13																																																																											
2.15	Session 14																																																																											
2.16	Session 15																																																																											
2.17	Field visit																																																																											
2.18	Session 16																																																																											
2.19	Session 17																																																																											
2.20	Session 18																																																																											
2.21	Session 19																																																																											
2.22	Session 20																																																																											
3	**Reporting**																																																																											
4	**Contingency**																																																																											
	Item																																																																											
1	**Staff**																																																																											
1.1	WUS Manager	1	1	1	1	1	1				1		1			1	1	1	1	1	1		1	1	1		1			1		1	1	1	1		1	0	1		1			1		1		1			1		1		1			1		1		1			1		1		1			1		1		1		
1.2	Resource person	1	1	1	3	3	3				1		1			1	1	1	1	1	1		1		1	1	1			1		1		1			1	1	1		1	1		1		1		1			1		1		1			1		1		1			1		1		1			1		1		1		
1.3	Farmer Trainer	3	3	3							1					3	3	3	3	3	3		3	3	3	3	3	3		3	3	3	3	3	3		3	3	3		3	3		3	3	3	3	3	3		3	3	3	3	3	3		3	3	3	3	3	3		3	3	3	3	3	3		3	3	3	3	3	3	
1.5	Field Assistant			3	3	3	3		3	3	3					3	3	3	3	3	3		3	3	3	3	3	3		3	3	3	3	3	3		3	3	3		3	3		3	3	3	3	3	3		3	3	3	3	3	3		3	3	3	3	3	3		3	3	3	3	3	3		3	3	3	3	3	3	
1.6	Coordination visitors																						1		1		1																	1		1		1																	1		1		1									
	Expenses																																																																											
	transport allowance	5	5	8	7	7	7	0	3	3	6	0	2	0	0	8	8	8	8	8	8	0	9	7	9	7	9	6	0	8	6	8	7	8	7	0	8	7	8	0	8	7	0	9	6	9	6	9	6	0	8	6	8	6	8	6	0	8	6	8	6	8	6	0	9	6	9	6	9	6	0	8	6	8	6	8	6	0
2.2	Stationery																																																																											
	Inputs																																																																											
2.3	refereshments															1	3						1	3						1	3						1	3						1	3						1	3						1	3						1	3						1	3					
2.4	misc costs																																																																											
	field visit costs																																																																											

Figure 4.1 (page 2)

Typical DL/AP Programme and Inputs for 500 ha Command Area

		Week 10	Week 11	Week 12	Week 13	Week 14	Week 15	Week 16	Week 17	Week 18	Week 19	Week 20
		36 37 38 39 40 41 42	1 2 3 4 5 6 7	8 9 10 11 12 13 14	15 16 17 18 19 20 21	22 23 24 25 26 27 28	29 30 31 32 33 34 35	36 37 38 39 40 41 42	43 44 45 46 47 48 49	50 51 52 53 54 55 56	1 2 3 4 5 6 7	8 9 10 11 12 13 14
1	**Planning**											
1.1	WUS Team Meeting											
1.2	Introductory meeting											
1.3	Site/Participant selection											
1.4	Curriculum planning											
1.5	Follow-up meeting											
2	**Implementation**											
2.1	Session 1											
2.2.1	Session planning											
2.2.2	Major school 1											
2.2.3	Minor school (x 3)											
2.2.4	Major school 2											
2.2.5	Minor school (x 3)											
2.2.6	Major school 3											
2.2.7	Minor school (x 3)											
2.2.8	Review											
2.3	Session 2											
2.4	Session 3											
2.5	Session 4											
2.6	Session 5											
2.7	Session 6											
2.8	Session 7											
2.9	Session 8											
2.10	Session 9											
2.11	Session 10											
2.12	Session 11											
2.13	Session 12											
2.14	Session 13											
2.15	Session 14											
2.16	Session 15											
2.17	Field visit											
2.18	Session 16											
2.19	Session 17											
2.20	Session 18											
2.21	Session 19											
2.22	Session 20											
3	**Reporting**											
4	**Contingency**											

Week 10

Item	36	37	38	39	40	41	42
1.1 WUS Manager	1		1		1		
1.2 Resource person	1		1		1		
1.3 Farmer Trainer	3	3	3	3	3	3	
1.5 Field Assistant	3	3	3	3	3	3	
1.6 Coordination visitors							
transport allowance	8	6	8	6	8	6	0
2.3 refereshments	1	3					

Week 11

Item	1	2	3	4	5	6	7
1.1 WUS Manager	1		1		1		
1.2 Resource person	1		1		1		
1.3 Farmer Trainer	3	3	3	3	3	3	
1.5 Field Assistant	3	3	3	3	3	3	
1.6 Coordination visitors	1		1		1		
transport allowance	9	6	9	6	9	6	0
2.3 refereshments	1	3					

Week 12

Item	8	9	10	11	12	13	14
1.1 WUS Manager	1		1		1		
1.2 Resource person	1		1		1		
1.3 Farmer Trainer	3	3	3	3	3	3	
1.5 Field Assistant	3	3	3	3	3	3	
1.6 Coordination visitors							
transport allowance	8	6	8	6	8	6	0
2.3 refereshments	1	3					

Week 13

Item	15	16	17	18	19	20	21
1.1 WUS Manager	1		1		1		
1.2 Resource person	1		1		1		
1.3 Farmer Trainer	3	3	3	3	3	3	
1.5 Field Assistant	3	3	3	3	3	3	
1.6 Coordination visitors							
transport allowance	8	6	8	6	8	6	0
2.3 refereshments	1	3					

Week 14

Item	22	23	24	25	26	27	28
1.1 WUS Manager	1		1		1		
1.2 Resource person	1		1		1		
1.3 Farmer Trainer	3	3	3	3	3	3	
1.5 Field Assistant	3	3	3	3	3	3	
1.6 Coordination visitors	1		1		1		
transport allowance	9	6	9	6	9	6	0
2.3 refereshments	1	3					

Week 15

Item	29	30	31	32	33	34	35
1.1 WUS Manager	1		1		1		
1.2 Resource person	1		1		1		
1.3 Farmer Trainer	3	3	3	3	3	3	
1.5 Field Assistant	3	3	3	3	3	3	
1.6 Coordination visitors							
transport allowance	8	6	8	6	8	6	0
2.3 refereshments	1	3					

Week 16

Item	36	37	38	39	40	41	42
1.1 WUS Manager	1		1		1		
1.2 Resource person	1		1		1		
1.3 Farmer Trainer	3	3	3	3	3	3	
1.5 Field Assistant	3	3	3	3	3	3	
1.6 Coordination visitors							
transport allowance	8	6	8	6	8	6	0
2.3 refereshments	1	3					

Week 17

Item	43	44	45	46	47	48	49
1.1 WUS Manager	1		1		1		
1.2 Resource person	1		1		1		
1.3 Farmer Trainer	3	3	3	3	3	3	
1.5 Field Assistant	3	3	3	3	3	3	
1.6 Coordination visitors	1		1		1		
transport allowance	9	6	9	6	9	6	0
2.3 refereshments	1	3					

Week 18

Item	50	51	52	53	54	55	56
1.1 WUS Manager	1		1		1		
1.2 Resource person	1		1		1		
1.3 Farmer Trainer	3	3	3	3	3	3	
1.5 Field Assistant	3	3	3	3	3	3	
1.6 Coordination visitors							
transport allowance	8	6	8	6	8	6	0
2.3 refereshments	1	3					

Week 19

Item	1	2	3	4	5	6	7
1.1 WUS Manager	1	1	1	1	1	1	
1.2 Resource person	1	3	1	3	1	3	
1.3 Farmer Trainer	3	3	3	3	3	3	
1.5 Field Assistant	3	3	3	3	3	3	
1.6 Coordination visitors							
transport allowance	8	10	8	10	8	10	0
2.3 refereshments	1	3					

Week 20

Item	8	9	10	11	12	13	14
1.1 WUS Manager	1	1	1	1	1	1	
1.2 Resource person	1	3	1	3	1	3	
1.3 Farmer Trainer	3	3	3	3	3	3	
1.5 Field Assistant							
1.6 Coordination visitors	1		1		1		
transport allowance	6	7	6	7	6	7	
2.3 refereshments	1	3					

	Item	contin-gency	Qty	Rate	Total
1	**Staff**				
1.1	WUS Manager	10	90	1,500	135,000
1.2	Resource person	12	110	1,000	110,000
1.3	Farmer Trainer	8	375	500	187,500
1.5	Field Assistant	15	375	300	112,500
1.6	Coordination visitors	4	25	1,000	25,000
	Expenses				
	transport allowance	74	1,000	50	50,000
2.2	Stationery		0		25,000
	Inputs				50,000
2.3	refereshments		80	600	48,000
2.4	misc costs				25,000
	field visit costs				45,000
	sub-total				**768,000**
	contingency			10%	76,800
	Tax deducted at source			15%	85,500
	Overheads			10%	93,030
	VAT			10%	102,333
	GRAND TOTAL			NRs	**1,125,663**
				US $	**8,659**
	Cost/ha			NRs	**2,251**
				US $	**30**

Some participants initially attended the WUS in the expectation of receiving a daily training allowance, rather than out of the interest and motivation specified in the selection criteria – some such people dropped out early on, but others appreciated the value of the school and continued to attend.

The actual composition of the schools was reviewed during the season against these criteria, and where there were any significant gaps in participation, additional participants were then encouraged to attend to ensure effective representation, either:

- to enable more people to benefit from irrigation
- to improve management as a whole.

There were two particular areas of difficulty:

- to recruit sufficient numbers of women who are actively farming (even regarding kitchen gardening and care of livestock as farming activities), old enough and in a position within the household, to be listened to and respected, and able to allocate the time to regular attendance for 4 ½ hours a week at a WUS.
- To persuade landless males to attend regularly because they depend on wage labour for their livelihood; they were often from ethnic groups who were systematically excluded from community activities, such as the Kumal at BIP and this made them see little point in attending.

We had to make continued and strenuous efforts to involve both of these groups, and others who were under-represented, using a variety of techniques as outlined in Section 4.3.3. For example, the curriculum was adapted to suit their interests; they were encouraged to attend even a small number of key sessions; other participants from the same group were asked to convince them of the value of attending; the field assistants made continued efforts to persuade them to attend; teaching methods were adapted to the needs of illiterate people; and the session timing and duration was adjusted to suit their other commitments.

4.2.3 Location Selection

The school site was chosen to be in a convenient location for all participants, taking account of:

- Availability of a suitable place for classes;
- Willingness of landlord to participate and provide land for the demonstration plot;
- Central location for the participants, with convenient access for all;
- Irrigation from the canal system through legal channels; and

- Visibility from roads or major paths, to facilitate dissemination of ideas.

In some cases it was difficult if not impossible to meet all of these criteria. In some schemes there is little legally irrigated land and this may not be centrally located. In such cases, a pragmatic compromise was needed.

4.2.4 Role of Major / Minor Schools

The Major School was the forum for the WUS Manager and the RP/SMS to introduce and explore the special topic for each week with the specially selected Major School participants. The role of the Major School was to stimulate participants to discuss key irrigation governance themes and issues, to identify practical measures to promote good governance, and to act on their ideas. The participants were then expected to share their learning from the Major School with the wider community.

The purpose of the Minor Schools was to provide a "platform" for Major School Farmer Trainers and participants to disseminate what they have learned to the wider community. The Minor Schools also provided the community with a channel to communicate their questions and concerns to the participants and management of the Major School. During the week following each Major School session, a Minor School session was held at each of three or four specially selected sites located at the head, middle and tail of the catchment of each WUS.

The Minor Schools were not intended to simply replicate content and methods of the Major School, but were intended to be a more informal means of dissemination of the findings of the Major School to the wider community and to feed back their concerns into the next Major School session. There was no requirement for regular attendance at the Minor Schools, and they lasted for just two hours. The Minor School sessions were run in a more informal way so that even marginalised and disadvantaged farmers were able to take part in the discussions.

4.2.5 Staffing

(i) School Manager

There was a school manager for each sub-project. These were chosen to be experienced in the concepts of farmers' field schools, rather than in the content of the curriculum. They were responsible for managing the school and ensuring that there were skilled resource people to cover each special topic. They acted as a facilitator for whole session and ensured the meaningful participation of all participants, keeping the discussions on track to achieve the basic objective of the session theme. They ran each Major School and ensured that farmer trainers could facilitate the Minor Schools. They did not usually attend those schools, but were involved in some Minor Schools to help ensure that they were run as required. Towards the end of each session, the school manager together with farmers' trainers helps to produce a plan for the Minor Schools.

(ii) Resource People / Subject Matter Specialist (RP/SMSs)

The objectives and methods of the WUS under the GGG programme are different from the training programmes that most resource people in the sub-project areas are familiar with. It was therefore very important for the Sub-project Managers and WUS Managers to ensure that all resource people received a thorough orientation in the objectives of the study, including the use of adult learning methods and the role of the WUS.

There was normally only one resource person / subject matter specialist for each theme at each Major School, but occasionally resource persons were invited from other key agencies (such as DOI or District Agricultural Development Office [DADO]) to improve linkages and co-ordination between water users and these agencies. The RP/SMSs were not normally required to attend or facilitate the Minor Schools – that was the role of the farmer trainers – but they did occasionally if specially requested by the farmers, or if there were special issues to be dealt with.

(iii) Farmer Trainers / Field Assistants / Social Mobilisers

These people played an important role in running the Major and Minor Schools. The administrative arrangements were slightly different in each sub-project (to suit local resources) but the overall requirements are the same. Generally they were local residents who had received some prior training under other programmes (such as IPM FFSs), although in some cases JTs or JTAs were used. Their tasks were to

- Facilitate aspects of the Major Schools, particularly for small group work
- Facilitate and manage Minor Schools
- Assist in reporting
- Encourage participation at Major and Minor Schools
- Keep WUS Manager informed of progress of Minor Schools, of any problems encountered, and participate in the resolution of these as appropriate, and
- Act as a link between the NGO and the farmers.

4.3 Implementation

4.3.1 Session Timetable and Plan

Each Major School session was planned to last for 4 ½ hours plus ½ hour for a tea break, typically from 7:30 am to 12:30 pm, with some adjustments to respond to the particular constraints of participants (e.g. a peak labour demand period, such as the month of *asadh*, to suit domestic demands on female participants, or other special events or festivities).

Each Major School session was divided into six "blocks": (1) Attendance and reports of Minor Schools, (2) Practical activity, (3) Special topic session, [tea break], (4) Demo plot activity (this will be combined with the practical activity when the special topic is agriculture), (5) Agricultural topic and discussion on field observation, (6) Implementation plan for Minor School, home work, and closing.

This structure provided for some agricultural content in every session. This gave time for participants to have weekly activities in the demonstration plot and for attention to be given to ongoing crop husbandry concerns throughout the season.

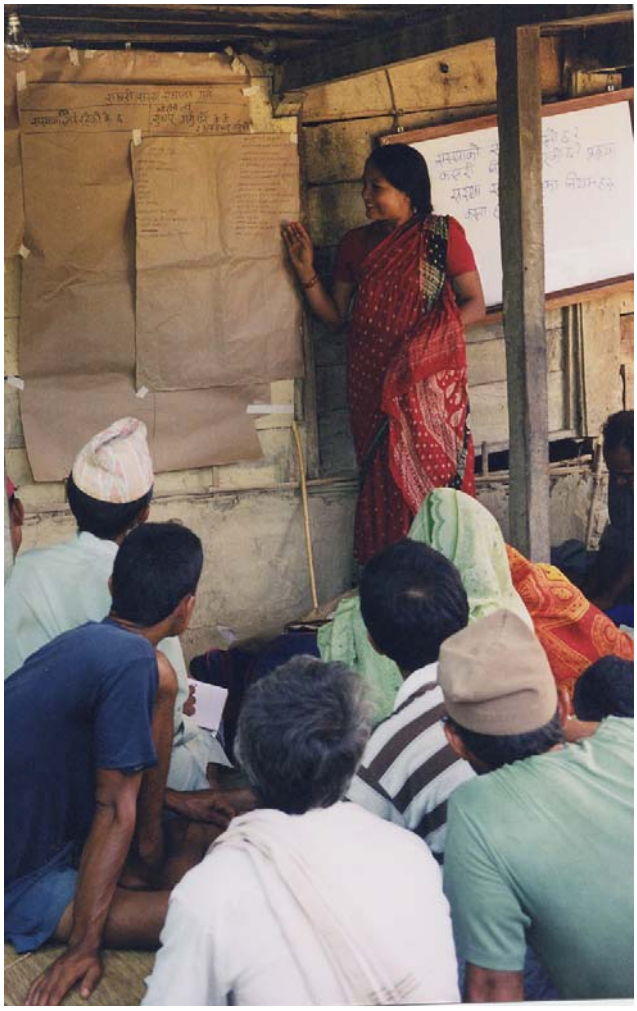
The Minor School sessions were shorter and generally ran for 2 hours plus a ¼ hour tea break, from 7:30 am to 9:45 am. The three main "blocks" or activities at the Minor School were: (1) Report on the activities of the Major School, (2) Demo plot/practical activity, (3) Discussion and comments for the Major School. In addition there was a period for taking attendance and introduction at the beginning, and for planning and closing at the end of the session.

4.3.2 Teaching Methods

In addition to adjusting the content, the WUS Manager and RP/SMS had to adapt their method of delivery of the material to the interests and needs of participants from different socio-economic groups to ensure that they felt they are benefiting from their participation, and so wish to maintain a high level of attendance. The participant selection criteria have been specifically designed to recruit a representative range of water users in a WUS catchment area. This meant that some participants were poor and landless, and many were women. It was very important for the sessions to be designed along "adult learning" principles (see Section 4.3.2(ii) below), being very practical, with a minimum of lecturing, and as much visualisation, role play, and small group discussion, pictorial show, group presentation as possible. This enabled those with little or no literacy skills, and participants from less dominant social groups to take part fully and actively in a mixed group. Developing their confidence and ability to work in this way was an important part of the school.

(i) Feedback from Minor Schools

A very important feature of the schools was ensuring that the learning was widely disseminated and that there was sufficient feedback to the schools so that they remained relevant and reflected all interests as described in Section 4.2.4. The Minor Schools were facilitated by participants of the Major School, and the facilitators of each Minor School reported back at the first session of the next Major School by giving a short briefing on the activities of each Minor School. Any points of disagreement or issues for further discussion which were raised by the Minor School were then discussed. This exercise also provided a recapitulation session for the Major School participants and it helped the WUS Manager to learn about the views of other people and decide on the topics to be discussed in the Major School.



(ii) Adult Learning Techniques

Each WUS session had a special topic as its core, and this usually started with a practical activity to put the topic into a 'real life' context. This could be an exercise on a canal – eg. planning maintenance, working out how best to manage water to irrigate all fields, understanding how structures should be operated. Institutional topics were often studied with a role play exercise, where the participants simulated a typical situation which needed to be solved by a WUA – eg. solving a dispute, preparing an operational plan. Participants were divided into small groups according to the nature of the exercise, and once they had completed the field exercise they reported their findings back to the whole group.

The special topic was then introduced by the WUS Manager by asking some quick questions to the participants to stimulate the participants and create an environment for the purpose of discussion. This was followed by a short brainstorming session to generate as many ideas as possible without judging them. Participants were encouraged to let ideas flow freely, building on and improving from previous ideas. These were listed exactly as they are expressed on a flipchart. This helped the more reserved participants feel bold enough to contribute. Ideas were then grouped and analyzed so that they belonged to the group rather than individuals.

Participants were then divided in to smaller groups to discuss one or two specific issues related to the special topic. They were divided into groups on the basis of well-being, gender, land tenure or location (head/middle/tail) to suit the issues to be discussed. This helped everyone to express their opinion and views without any hesitation, and enabled them to generate many ideas, comments and opinions related to the theme of the session.

After the group work, one member of each group was encouraged to present the group's opinions and ideas to the whole group. Once one group had made their presentation, the remaining participants were encouraged to provide feedback, and the school manager supported them by commenting on positive aspects of the presentation, and making concrete suggestions. After completion of all group presentations, the facilitator synthesised their conclusions and helped develop them into an action

plan which could be implemented by WUA with the help of WUS participants.

In the early days of WUS, most participants (especially women) were reluctant to stand in front of the other participants to present their views. As the session proceeded, they became more confident and willing to express their opinions. The WUS helped to build their confidence and develop leadership skills.

We often did a role play during the special topic block in which participants were encouraged to express their experiences as in a real life situation. Role plays were found to increase the participants' self-confidence and give them the opportunity to understand or feel empathy for other people's viewpoints or roles. Role plays were also useful to consolidate different lessons in one setting, and often stimulated very lively discussions amongst the participants.

The session was also broken up by short energisers (games and jokes) which were used to help people relax and to create an environment in which individuals and groups felt free to experience, reflect and change. They were invaluable for rounding off or introducing a session, developing new skills and exposing participants to new ways of judging their own actions, particularly in relation to the impact on group work.

(iii) Agriculture

The participants were always very keen to learn more about the agriculture related activities (crop plan, diseases, dosage of chemical fertiliser, variety and pesticides etc), so a small agriculture block was inserted towards the end of the session to encourage them after listening and participating in the special topic. Agriculture was a valuable catalyst for the school, and these topics were useful for encouraging people to attend. The primary focus in the WUS was on institutional development and water management, but there is a need for improved agricultural extension. The extent to which this can be covered in the schools depends on how the WUSs are related to other agricultural activities

Each school (both major and minor) had a small demonstration plot which was intended to provide a focus for the practical activities. Agricultural and some water management field activities were done on these plots. The layout of the plot included demonstrations of the different agricultural and water management practices that were covered in the WUS sessions. The number of different treatments was limited to suit the topics covered in the WUS and was restricted to that which can be well-managed in the school. They were not intended to be statistically rigorous trials. The layout was agreed between the NGOs and the participants seeing the sessions to be covered by the content of the WUS in the first sessions of the schools.

Participants made brief observations of the demonstration plots in each session, for which they were guided about the type of observations to make so that they could share them with the rest of the group after returning from the field. Further activities were done in the demo plots in those sessions where the special topic was related to agriculture.

4.3.3 Sessions of Particular Interest

There were two categories of session which required particular attention when designing the session timetable: participatory evaluation, and sessions which address issues which are of special interest to landless and female participants.

Participatory Evaluation: A participatory pre- and post-evaluation procedure on the themes of Institutional Development and Water Management was incorporated into the season programme. This procedure aimed to document participants' changing perceptions and evaluation of their water course/branch in relation to these themes, as well as to stimulate participants' thinking about these themes. It was also intended to stimulate their understanding of the need for them to continue monitoring and evaluating the WUA in the future.

The pre-evaluation was conducted in two parts: in the first Institutional Development session of the season, and the first Water Management session. In the respective session, participants were asked to identify, in small, socially homogeneous groups, the criteria for judging a good WUA, and for judging good Water Management. After the criteria were consolidated and ranked, participants then individually scored their own water course/branch against these criteria. The individual scoring was done in a small group so that those with literacy problems could get help from others in the group or from a facilitator. In order to protect privacy and confidence, particularly of socially disadvantaged (or less confident) participants, the scores given by individual participants were not announced to the group.

In addition to using this exercise to get a "baseline" view of participants' assessment of their watercourse or branch canal, the WUS Manager and RP/SMS for these sessions used the pre-evaluation as an initial orientation for participants on the two themes, during which they discussed with participants the way that they judged their system, the reasons for the scores they assigned, the strengths and weaknesses of the system as reflected in these scores, how their system could be improved, and how they will judge if the system has improved.

In the second-to-last session of the season participants did a post-evaluation of their WC/B, using the same criteria they identified in the pre-evaluation (or in some cases slightly modified criteria), and scored their system again to provide a basis for discussing any changes they observed, and the reasons for those changes (or lack of change). They also identified actions that they can take after the end of the WUS, to work toward any improvements in the system which they thought necessary.

Landless and Women: one of the key objectives of the study was to identify ways to improve the contribution of irrigation management to the livelihoods of the poor and marginalised, including the landless and women. Demands of employment and household work make it difficult for the landless and some women to attend Major School sessions regularly. The session design was adapted to maximise the benefit to the landless and women from participation in the WUS.

- The special topic block was timed for the first part of each session, before the tea break. The landless and women were encouraged to attend every session, at least until the time for tea, so that they could be involved in the discussion of institutional development and water management issues that affect their livelihood.

- The orientation and discussion questions prepared for each special topic took account of the full range of concerns among participants, including those of particular interest to the landless and women.
- When forming small discussion groups, care was taken to ensure that the social composition of each group will be conducive for everyone to have a voice and to be heard. This is particularly important for those of poorer socio-economic status, and women, who tend not to speak up in a large or mixed group.
- Some sessions focused specifically on issues of concern to landless and to the way that the behaviour and organisation of everyone living, owning land or working in the WUS catchment affects these issues. A special effort (such as pre notice on the main theme of the session) was made to encourage greater attendance by the landless at these sessions.
- All water users in the WUS catchment were invited to attend a Minor School, and great effort was made to ensure that the landless knew about the Minor Schools, and how their activities might benefit and be of interest to them.

4.3.4 Exposure Visits

The exposure visits were intended to be an integral part of the Major School and aimed to help the participants to understand how other WUAs run their system and how they have solved problems. They were planned as part of the overall curriculum, and they were very popular and gave some people a strong incentive to attend the schools. However, this was not their primary purpose.

- Participants were selected from regular attendees of the Major Schools – they were required to have attended at least 70% of sessions up to the time of the visit.
- The locations and objectives of the visit were planned after the participatory pre-evaluation sessions, to be relevant to the key issues identified in these sessions.
- Sites visited included other parts of the same system (in the case of very large systems where participants may not be aware of the whole system layout), or other schemes (both farmer-managed and transferred agency-managed schemes) where the farmers have faced similar problems and made some progress towards solving them.

4.3.5 Linkage with Other Tiers of WUA and Agencies

When exploring each special topic, the WUS Manager and RP/SMS helped participants to identify actions which participants themselves can take to address the issues that come up through discussion. In some cases, these actions required participants to work with other WUAs or other water users (both in their own canal and at higher levels in the system). For some issues, the participants also needed to connect with agencies, NGOs or CBOs, such as the Department of Irrigation, Department of Agriculture, Forest Users' Groups, Farmers' Groups, etc.

The WUS acted as a catalyst to promote these institutional linkages and communication to complement the work done within the schools.

- At the beginning of the monsoon season officers from higher tiers in the water users' organisation, and other agencies, NGOs and CBOs were informed about the WUS programme in their sub-project area, and invited them to attend WUS sessions as participant observers.
- The WUS Manager made a point of inviting specific officers to attend particular special topic sessions when he anticipated that participants would raise issues which were directly related to the activities and services of the officers' agency or organisation.

- Some agency personnel such as DADO, DOI engineer and others were invited as an RP/SMS in the WUS.
- The curriculum for each WUS included a special session to address issues of cooperation and coordination between institutions and agencies at various levels. Officers from higher tiers in the water users' organisation and from other agencies, NGOs and CBOs (as appropriate) were be invited to attend this session in particular.
- The WUS Manager encouraged participants and officers, independently of the WUS, to organise their own follow-up meetings and activities to address issues of common concern.

4.3.6 Reporting

In the course of the school, the participants did a lot of exercises and activities which were of direct relevance to the management of the irrigation system. These were transcribed and recorded in a form which is useful for them in the long term. For example, they prepared action plans, developed rules and improved communication systems which they should implement. This documentation was consolidated and presented back to the participants and the WUA at the end of the season. It has helped them to remember what they produced over the season and to prepare a final action plan to improve the management aspects of WUA.

For the purpose of this project far more comprehensive documentation was compiled as a record of the discussions, but this was required for action research purposes and would not be needed for 'normal' schools. This documentation is bound separately as an annex to the case study reports, and is in the form of a Microsoft Access database.

5 Dissemination of Findings

The findings of the DL/AP and the first season WUS were disseminated at a workshop held in Kathmandu, and the discussion at this was used to inform the approach for the remainder of the study period.

It is too early to evaluate the impact of the programme as a whole, although follow up visits were made for preparation of the final workshop to gauge initial perceptions and reactions.

A final workshop was held four months after completion of the WUS and draft case study reports, and the discussion resulting from this has been used to inform the preparation of the final report and recommendations.

The workshops were attended by representatives of the Ministry of Water Resources, Department of Irrigation, Donors (DFID, USAID, World Bank, Asian Development Bank), consultants in the irrigation sector, NGOs active in the irrigation sector, NGOs and consultants involved in community forestry, National Federation of WUAs, and the WUAs involved in the study.

The findings have also been disseminated to the World Water Congress in Madrid in October 2003 and to the Farmer Managed Irrigation Systems Promotion Trust in September 2004.

6 Impact of the Programme

6.1 On Participants

(i) Impact of DL/AP

The objectives of the DL/AP were stated earlier to be to:

- Identify and involve all groups of stakeholders in the study; and
- Collect sufficient information to develop an action plan for the next stage of institutional development.

It was found to be highly effective for this, and in fact had a far greater impact – this is discussed further in Part 1 of the overall report. It was found to:

- Involve all sections of community in an effective way, and stimulate their interest in the irrigation system.
- Make water users become more aware of their role in relation to the irrigation system.
- Provide a forum for users to express their views and to start improving communication and trust between users and WUA.
- Enable users to identify and think about solutions themselves.
- Build ownership of the overall program.

(ii) Impact of Water Users' Schools

The WUS were envisaged as a way of increasing and improving the livelihoods assets of all irrigation stakeholders. The approach was to target human capital – skills, knowledge and awareness – in order to enhance social capital (shared values, institutions and power/influence) and thereby increase natural capital (through more assured access to water) via improved physical capital (well-maintained canals) and financial capital (resources for management and maintenance contributed by users).

The impact of WUS can be grouped in three categories:

- Change in knowledge, attitudes and practices (KAP) of water users
- Change in activities
- Long-term impact

The changes in perceptions and attitudes are aimed at ensuring that improved skills and knowledge lead on to enhanced social capital as well as physical, natural and financial capital. These are reflected in the short term by some changes in immediate activities, but achievement of the desired long term impact will probably depend on some further support, although at a lower level than that provided in a WUS.

The project enabled water users, through the DL/AP and WUS, to evaluate the status of their own institution and to reform and strengthen it, and demonstrated that by actively involving water users in the analysis of their irrigation system they can improve its governance. Some indications of the impact of each school is given in the case study reports (Part 2C) and in the community evaluation study (Section 6.2), although it is too early to judge these rigorously.

6.2 On the Wider Community

An evaluation study was carried out towards the end of the project period to assess the 'spread effect' of the DL/AP and WUS. This recorded the feelings and perceptions of non-participants to assess the impact on them and so that these views could be allowed for in the remaining sessions of school. Some adjustments were then made to the curriculum and some extra topics added.

The evaluation was done in recognition of the fact that it is never possible to include all stakeholders directly in a capacity building programme, and that it is necessary to design a programme so that those who participate also disseminate their learning and experiences to non-participants. The selection of participants, the nature of the curriculum, and the Minor Schools were planned with this in mind.

Key findings from this evaluation on people who did ***not*** directly participate include that:

- A large majority of farmers were aware of the programme and its objectives; although many were not aware of the details of the WUS activities, they did observe that it had a positive impact in some areas;
- Most farmers believed that it had improved irrigation management at BIP and SMIP, particularly by improving standards of maintenance (in which they participated); at KUIS they believed that it had made the WUA better able to cope with unusually adverse river conditions, by developing better procedures and involving women in a more substantive way;
- Many farmers remained unclear about the formal structure and role of the WUA at SMIP and BIP, as these had been formed long before without much participation, but they were aware of some re-organisation and improved procedures at BIP as a result of the school, and farmers at SMIP felt that the WUGs had become more active although in a relatively informal way – in both cases farmers reported a beneficial impact in the way the various committees worked;
- Farmers believed that rules and regulations had been improved at BIP and KUIS; many farmers at SMIP remained unclear of the rules, but became more assertive of their rights and believed that operational rules had improved as a result of the school.

6.3 On the Water Users' Association

Some members of the WUA were involved in the DL/AP and some were included in the schools. It was important to include representatives of all groups and ensure a good linkage between the WUS participants and the WUA otherwise it would be easy for the school to make recommendations which were not implemented. Some changes in the WUAs were noted as a result:

BIP: sub-committees were formed to manage sections of the branch canal; improved procedures and record keeping; greater ability to mobilise farmers for collective work; leadership more motivated to manage system.

SMIP: responded to pressure from members to organise some meetings at WUG and WUC level, but most people felt that new elections are essential to give the WUA credibility; as this could not be arranged because of the political situation, they relied on more informal arrangements for improving management.

KUIS: branch committees gained status and became more active and responsive to farmer needs. Main committee improved procedures and was able to mobilise exceptional resources for maintenance. Women included in decision-making (as well as being permitted to participate in field activities).

Appendices

Appendix A: The Logical Framework

Project Title: *Guidelines for Good Governance*

Narrative summary	
Goal: Improved management of water resources	
Purpose:	
Water Users • Equitable and sustainable management of water resources by beneficiaries.	***Policy*** • Improved poverty focus for water resource management and effective input by poor farmers into policy formation
Outputs:	
Water Users • Inventory and review of schemes/ catchments, covering performance, systems of management, conditions, conflicts, constraints and opportunities for reform. • Improvement in water management by reformed institutions, incorporating interests of poor farmers and indirect users as well as beneficiaries	***Policy*** • Guidelines for good governance, which encompass the means to adapt rules and institutions to suit local requirements. Recommendations for national policy reforms
Activities:	
Water Users • Review of best practices; • Rapid appraisal of resources, rights and responsibilities for management of irrigation and related activities; • Selection of sample of schemes / catchments for more detailed analysis • Participatory analysis of institutions on each site to define objectives (including perspectives on poverty); assess rights / responsibilities; identify external / internal reform; assess support measure; initiate reforms. • Modified institutional structure set up – Objectives defined – Organisations constituted / registered – User training – Monitoring by users	***Policy*** • Planning / support for Government Agency reforms – Analysis of institutions and legal framework – Support for WUAs • Synthesis – Preparation of guidelines – Incorporation in policy – Incorporation in university curricula • Dissemination – Newsletters, workshops, papers

Source: Mott MacDonald Ltd. Sept. 2000. "Guidelines for Good Governance: sustainable management of large-scale water users associations – R8023". Scope of Work.

Appendix B: Maps of Sub-Projects

Figure B.1
Sunsari Morang Irrigation Project

Figure B.2
Sunsari-Morang Irrigation Project

SS9-E

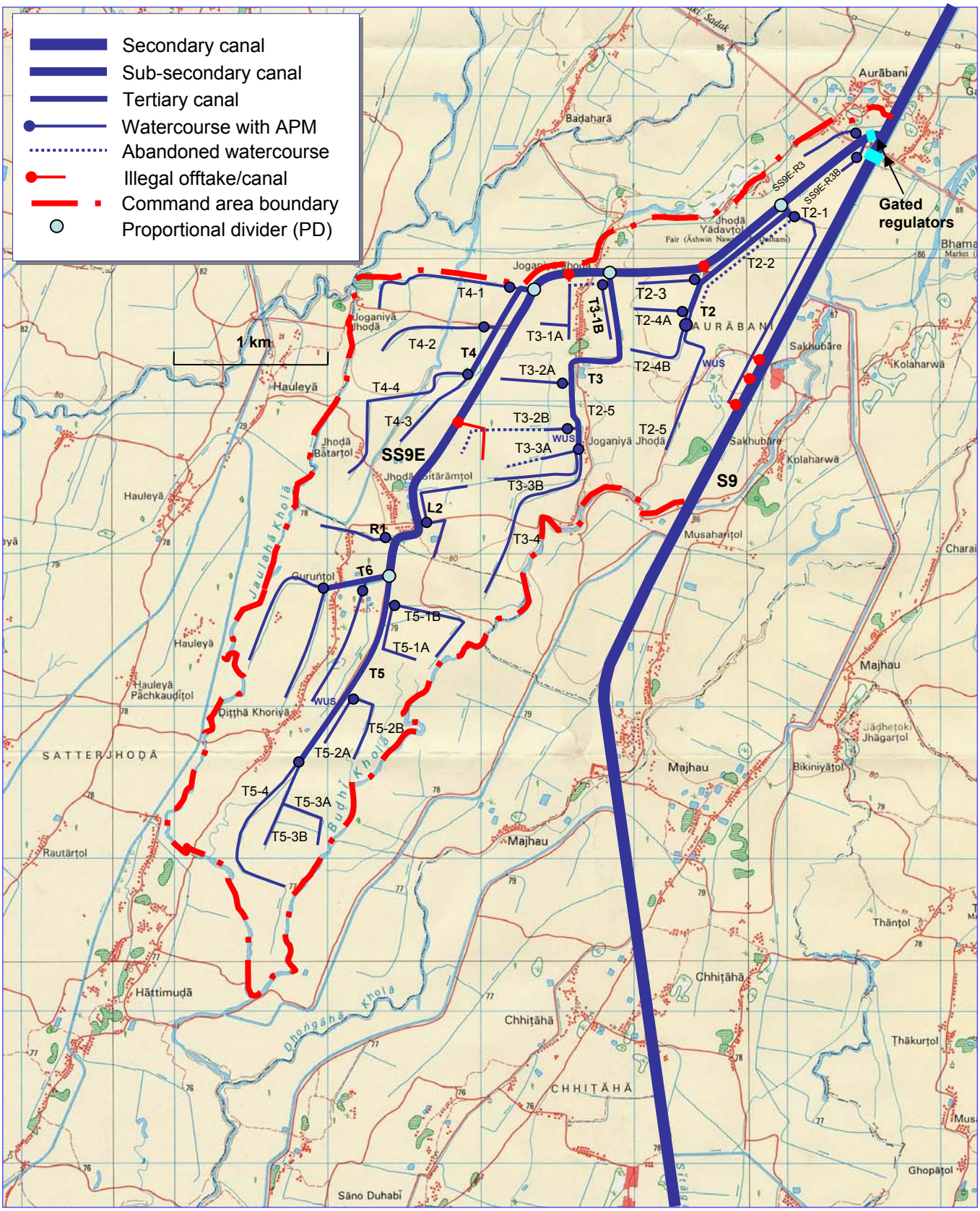


Figure B.3
Kamala Uttarbahini Irrigation System

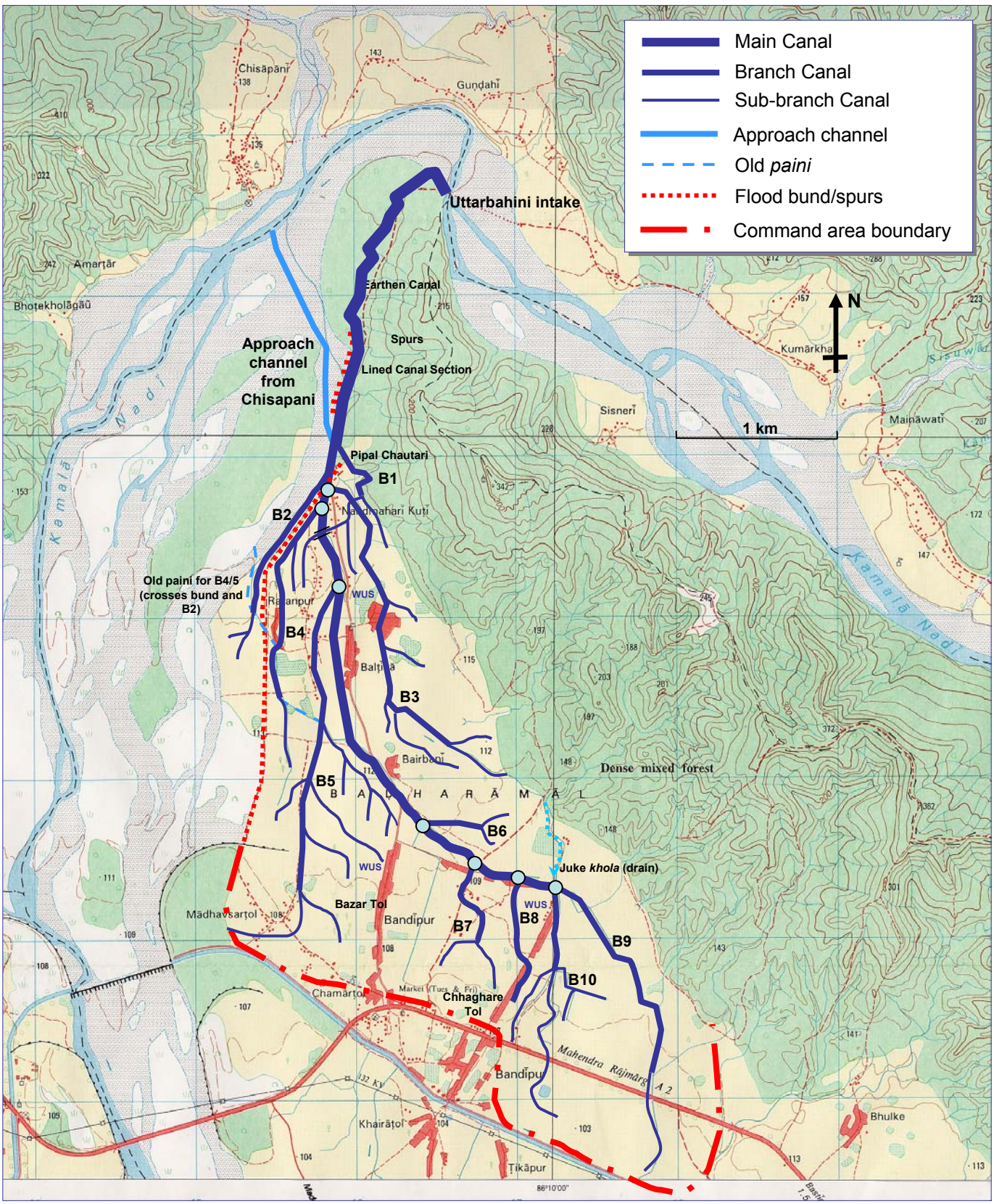


Figure B.4

Bijaypur Irrigation Project

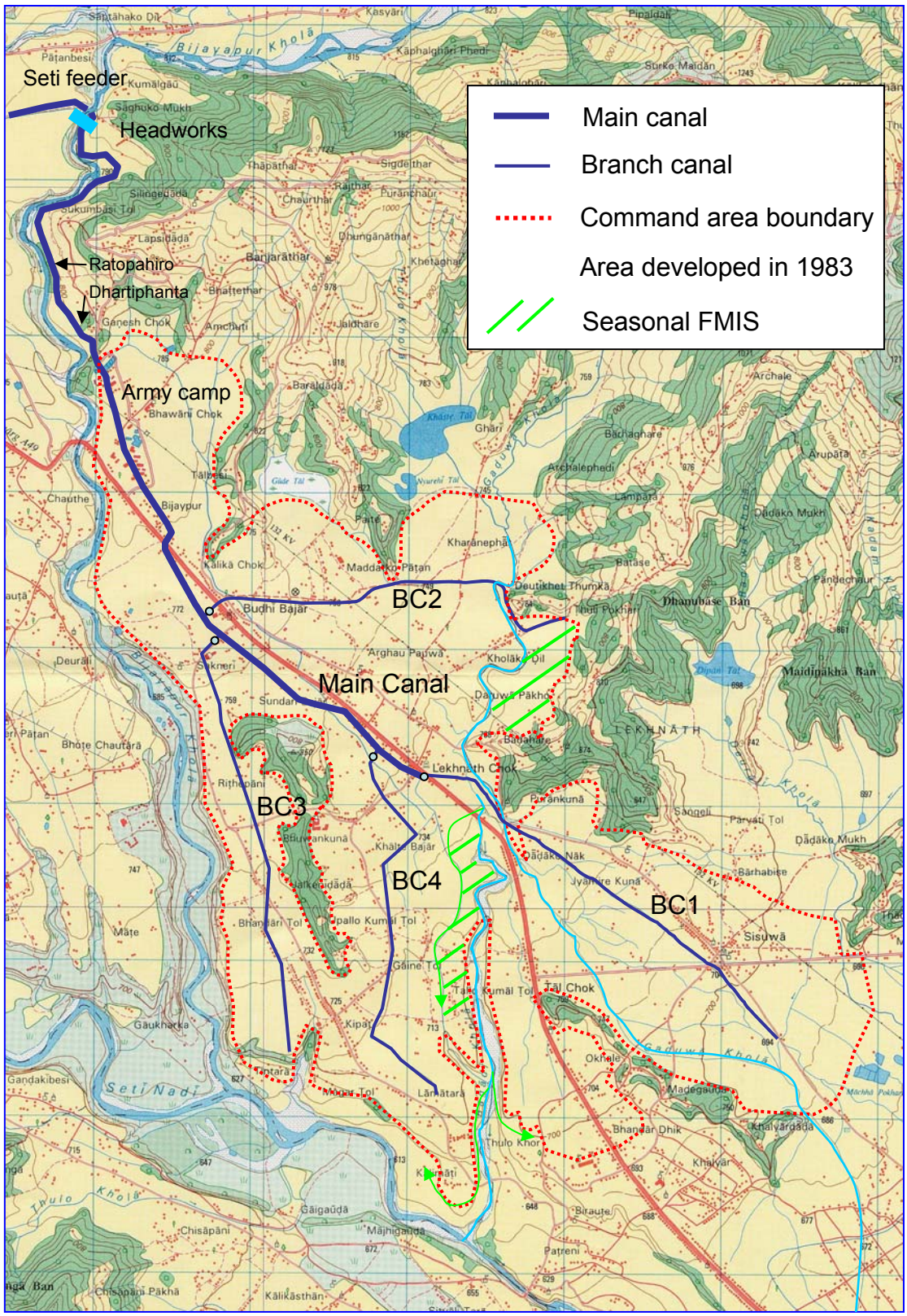
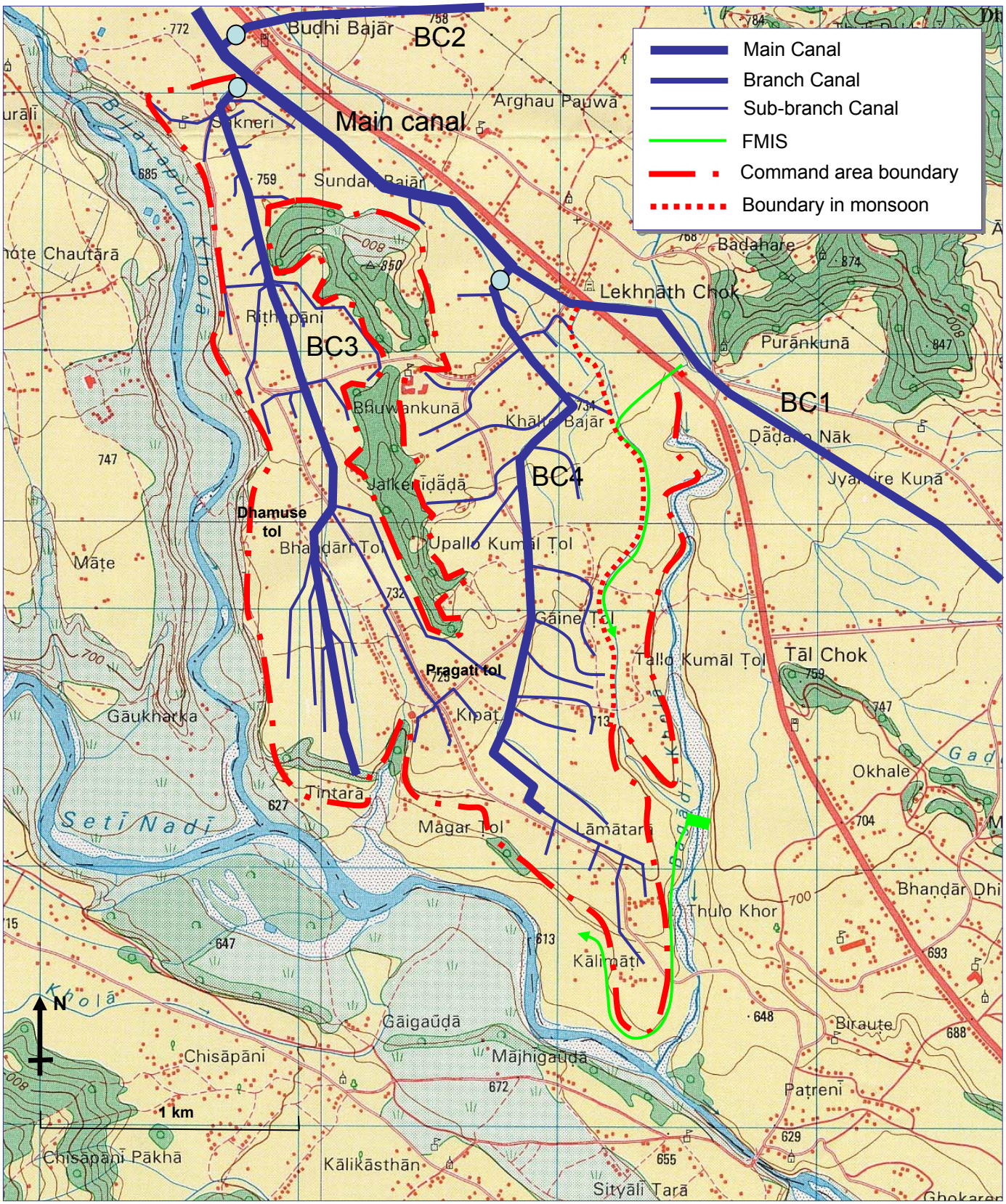


Figure B.5
Bijaypur Irrigation Project



Appendix C: Review of Past Projects

C.1 Lessons Learned from SMIP in First Phase of this Study

C.1.1 Diagnostic Studies in Monsoon 2002

During the Monsoon Season of 2002 (June to October), a detailed diagnostic study was conducted in part of Stage II of the Sunsari Morang Irrigation Scheme. The canals studied were nine watercourses in three tertiary canals (T2, T3 and T5), which together serve about one half of the 720 ha covered by the sub-secondary canal. Social, agricultural and hydrologic data were collected in order to obtain a deeper understanding of social and institutional characteristics and attitudes, agricultural practices and water use, and physical conditions and water flows within this hydrologic unit.

The diagnostic activities completed in these tertiary canals included:

- Institutional Assessment of Water Users' Groups by means of key informant interviews and Focus Group Discussion with Water Users' Groups representatives;
- Field observation and documentation of agricultural and irrigation practices over the duration of the monsoon season 2002, of 15 sample farmers representing a range of holding size and land tenure[10];
- Detailed survey questionnaire of 51 sample households, representing small and medium landowners and landless farmers and labourers. The questionnaire covers land holding size, irrigation practices, household composition, employment and labour use, cropping and marketing, livestock ownership, other economic activities, sources of water for various purposes, canal operation and maintenance, water user group membership, participation in activities, and attitudes toward the institution.

Analysis of these findings in conjunction with the Stage 1 studies indicated several problems related to irrigation management, including:

- Policy and legislation to provide appropriate support and legal powers to irrigation management organisations
- Allocation of responsibilities amongst different institutions, or between different levels of water user organisations which are registered as a single legal entity (as at SMIP)
- Financing systems, including the ability to enforce fee collection
- Links with external organisations and access to other inputs to make effective use of water
- Conflict management systems
- Monitoring systems
- Ability and willingness of users to reform management

[10] Big landowner/owner cultivator (1), Medium Landowner/owner cultivator (3), Small landowner/owner cultivator (4), Tenant (2), landless/sharecropper (2), Female/undefined tenure (2)

C.1.2 Legal Aspects of Irrigation Management

There are several legal issues[11] that are emerging with regard to irrigation management, and there are conflicting or overlapping provisions in the policy and legislation. A new irrigation policy has been approved (2003) and new regulations (2004), but the Water Resources Act now needs to be revised to make it possible to implement these new provisions fully – but this is unlikely to happen in the current political situation.

Recent decentralisation legislation (1999) has potentially filled one gap in the legislation relating to conflict resolution, but this is still not clear. Social pressure used to be relatively effective in ensuring compliance with rules on traditional irrigation schemes, but this is increasingly inadequate. It is becoming difficult to mobilise sufficient resources from the community to manage irrigation, and to prevent conflicts over water distribution.

A specific issue is the legal authority to collect user charges; this has the result that collection rates are far too low to cover O&M costs. Although WUAs are nominally autonomous, they do not have the authority to fix charges. These are determined by a district level committee, which does not distinguish between the amount that the WUA needs for its own management and that which the DOI needs for system management. The policy gives the land revenue department authority to refuse collection of land tax until a receipt for water charges is produced, but this system has now lapsed.

There are some old disputes that are difficult to resolve satisfactorily, but most cases are solved without recourse to courts. Issues include:

- limited authority to set fee levels and to enforce collection of fees;
- damage to crops due to canal breaches;
- disposal sites for sediment excavated from canals;
- placing checks in canals to raise water levels to command high land;
- land acquisition for field channels;
- compliance with constitution (or conversely appropriateness of constitution for local situation)
- illegal outlets or other modifications to the system to obtain water out of turn

It should be noted that policy and regulations are being continuously updated and some of these problems have already been addressed, although much depends on passing new water resources legislation which is not possible in the current political environment

C.1.3 Technical Features of SMIP

SMIP is a large project that has been rehabilitated over the past 25 years, and is in generally good physical condition. The design concept has been revised several times since the original construction and it now conforms to the 'structured' system[12], whereby responsibility is handed over to users at a defined point in the system. Canals at lower levels should either flow full or be closed, and a rotational system is introduced to achieve this. Although a very simple concept, the users at SMIP do not operate the system in this way and they make numerous informal adjustments to water distribution for several reasons, including:

[11] Some of these issues were addressed in revisions of the irrigation policy in 2003 and regulations in 2004: detailed analysis of any shortcomings at the time of the field study is therefore no longer appropriate, but these issues are discussed further in Part 1 of the overall report

[12] Albinson & Perry, 2002. Fundamentals of Smallholder Irrigation: the Structured Irrigation System Concept, IWMI Research Report 58, Colombo, Sri Lanka, 2002

- to cope with fluctuating flows in the main supply system;
- to reflect local variations in irrigation requirements;
- to compensate for a field layout which does not enable irrigation on all plots; and
- theft of water by some individuals as a response to insufficient supply to meet water requirements for the whole area.

The complexity of design and the nature of the adjustments made by farmers meant that it was considered important to collect some quantitative data on water distribution within the study area .

The main system is managed relatively well with a generally predictable rotation of water for 4 days out of 8 at the head of the sub-secondary canal, although it is closed at times of high sediment load in the river. This can disrupt the system for longer than the actual closure due to the time for filling canals and means that some farmers lose their turn for irrigation. No serious conflicts have been observed so far and there are few tubewells in this area, which suggests that the performance of the system is better than on many other large-scale systems in Nepal.

C.1.4 Observations from Field Studies at SMIP

C.i Land tenure and irrigation

Irrigated agriculture contributes about 60% of incomes on average, but in the case of small tenant or sharecropping farmers (who are over 30% of the population) this figure drops to about 30% although much of the off-farm employment is related to local agriculture. Small owner cultivators (30% of the population) also depend on off-farm employment to ensure their livelihoods. It is only large landowners and richer tenants (who farm more than 1.67 ha) who are able to earn the majority (70%) of their income from irrigated agriculture. Thus most farmers have a low dependency on irrigation (which is perhaps a vicious circle, because of its unreliability) and seek alternative sources of income – both locally and overseas. Despite this, land ownership is well-correlated with wealth, since small landowners and tenants are more likely to be dependent on low paid local intermittent employment (often seasonal).

Land is fragmented, with most farmers cultivating more than one plot of land and on more than one watercourse. However, most farms are within a single tertiary canal command. At least 30% of the population are sharecroppers or tenants and thus not eligible for membership of water user groups. Some sharecroppers are however active in canal management and for example in SS9E/T5 a sharecropper organised the farmers to maintain part of the tertiary and sub-secondary canal.

C.ii Water supply

Although the water supply in the sub-secondary canal is predictable but inadequate, it becomes increasingly variable at a tertiary and watercourse level, particularly for small tenants and sharecroppers. The system is designed to operate automatically with little intervention by users. However, as the supply is less than that required and there are local variations in requirements, farmers make many informal adjustments or install illegal outlets to compensate for the inadequate official supply – although small farmers are apparently less able to do this. The time lag in filling canals means that, unless illegal outlets can be controlled, a 4 day rotation (the design rotation) is inadequate for tail end canals; some illegal outlets are required to solve technical problems, others are installed simply to steal water. Over 25% of farmers are dependent on ‘illegal’ or unofficial outlets, but this does not ensure they get a reliable supply. Indirect irrigation from seepage water or drain flows is important in some areas, which has a significant impact on irrigation institutions.

About 25% of farmers – particularly small farmers use canal water for other purposes as well as irrigation (livestock, fishing and domestic uses). Small farmers, who are more likely to have an erratic supply, often have to guard their outlets to prevent theft of water. Irrigation is supplementary and does not increase yields by a very large amount. Thus, the yields are still low (around 3 tonnes / hectare), which is partly due to the unreliability of irrigation which means that investment in other inputs does not yield the full benefits.

Many watercourses and tertiary canals are on fill, which creates problems of cross-drainage, seepage losses and risks of breaches and hence high maintenance costs.

C.iii Resource collection

There is a *bighatti* system whereby members of a watercourse either collect fees (typically Rs75 per hectare per year) for maintenance of the watercourse, or undertake direct labour for this purpose. This contribution is equivalent to about one labour-day per household per year. There is some involvement by users on tertiary and sub-secondary level maintenance, but this is organised in response to a crisis on an informal basis by users (and not by the WUG).

The WUC secretary (who is also an SMIP employee[13]) is responsible for collection of ISF (*panipot*). He keeps 50% of this at WUC level, while the remaining 50% is shared out amongst higher tiers of the WUA and with SMIP. The WUC secretary later returns 50% of the ISF he collected to the WUG to maintain their watercourse. This is a rather bureaucratic and cumbersome way of helping watercourse maintenance. Furthermore, as ISF is set at a very low level (NRs 200[14] or less than £2 per hectare) and is hardly collected, the amount is negligible and has little impact on maintenance funding although it does reduce the need to collect *bighatti* in some watercourses and part may have been used for tertiary canal maintenance.. Fee collection is not enforced and there is increasing reluctance amongst those who paid in the past to continue paying when they see that no sanctions are imposed on the majority who do not pay.

C.iv Institutions

The WUA comprises a hierarchy of four levels. The Water Users' Central Co-ordinating Committee (WUCCC) is responsible for the main system and co-ordination with DOI. There is a Water Users' Co-ordinating Committee (WUCC) for each secondary canal (5,000 ha), a Water Users' Committee (WUC) for each sub-secondary canal (500-750 ha) and a Water Users' Group (WUG) for each watercourse (30 ha).

These organisations have little role and are mostly very weak – few people understand what they can or should do. Their roles are ill-defined and their responsibilities are not very onerous – indeed the institution appears over-complex, with a large committee, for their current function. As noted above, there are many absentee landlords who are non-resident, but who are eligible to be members of WUA. On the other hand, sharecroppers, who are local, are unrepresented in the WUA. The higher levels particularly WUCCs and above act as intermediaries with SMIP, and have the influence to resolve local problems (although they are not often asked to do so). Farmers usually only request their assistance when there is a prolonged problem which affects a large number of people.

The WUG committees rarely meet and do not yet have much role – the performance of the organisation is more dependent on the personality of the chairman or other key individual than on the institution. However, some do organise watercourse maintenance and in one case (T3-4) they organise a rotation system within the watercourse. Elsewhere there is little evidence of systematic planning of

[13] His employment was discontinued in 2003, but SMIP then authorised the WUC Secretary to keep 15% of the ISF collected to cover his costs – however this is much less than his previous salary which made him reluctant to continue the task
[14] Increased to Rs 300 in 2003

water distribution at watercourse - in some watercourses there are informal understandings for how water should be distributed and they may have slightly different systems for land preparation/transplanting and for crop growth stages for rice. However, these functions are sometimes taken on by individuals outside the WUG – for example in T5, a prominent sharecropper and other farmers organised the village to maintain one reach of the sub-secondary canal. The WUG chairman was not interested as his was low land, which got a reliable supply.

There is no formal institution at tertiary level although there are several problems of water management and canal maintenance and some key decisions on operation need to be taken at this level (100-200 ha). In practice these decisions are not taken until a crisis develops and the WUC or WUCC is involved, whereas effective management at tertiary level could prevent such a crisis.

The WUC (sub-secondary level) has little authority and has almost lapsed. It now rarely meets (perhaps once per year) and there has not been a quorum at any meeting in the last two years. It mainly discusses issues over which it has no control or responsibility – often to make requests to the project for additional structures. The WUC several times made the decision that ISF collection should be enforced and that water supplies should be stopped. However, they did not have the legal authority to act on this decision. The secretary is also an employee of SMIP[15] and is the main point of contact for many farmers. The chairman was selected because he is an influential landowner from the tail of the system and was thought likely to ensure that there were good supplies throughout the canal. However, his land is well placed to have a reliable water supply even when the canal is erratically managed. Although, he was considered effective in the early days of the WUC, he has either lost interest or been unable to manage the system for the last few years. There has been no election so he has remained in post but inactive.

The WUCC (secondary level) is a key level in the hierarchy as it is the only committee that is legally able to manage a bank account. The chairman is an influential contractor and manages much of the maintenance of secondary, sub-secondary and tertiary canals under contract to SMIP – some of the low-level maintenance may be done using their share of ISF, although it is difficult to get a clear picture of this. He has the power to influence water distribution in the secondary canal command, and was the person who authorised a modification of the main system rotation when the tail of SS9E had inadequate water at the end of the season.

C.v Agriculture

The entire area is cropped with rice in the monsoon apart from small areas of jute (for domestic use). There is little scope for changing this, but there are agricultural practices that could reduce the overall requirement for water. This can be partly done by individual farmers by appropriate choice of varieties or on-farm techniques, but also requires group co-operation to ensure that the limited water can be delivered in accordance with an agreed schedule.

The yield increase with irrigation is small at present. Amongst the reasons for this is the low level of improved input use when irrigation supply is unreliable.

[15] SMIP discontinued his employment in 2003, but he continued to work as unpaid Secretary of the WUC

C.1.5 Conclusions from SMIP

The preliminary analysis of the diagnostic investigation conducted in Sunsari Morang over the past monsoon season has yielded the following observations.

C.i Land tenure and irrigation

- Irrigated agriculture contributes about 50% of incomes on average, thus farmers seek alternative sources of income – both locally and overseas.
- Land is fragmented, with most farmers cultivating more than one plot of land and on more than one watercourse. However, most farms are within a single tertiary canal command.

C.ii Water Supply

- The water supply in the main system is fairly reliable, but it becomes increasingly variable at a tertiary and watercourse level, thus farmers make many informal adjustments. 'Illegal' outlets and indirect irrigation from drains are important and have significant impacts on irrigation institutions.

C.iii Finance

- There is a *bighatti* system whereby members of a watercourse maintain their watercourse.
- Collection of ISF (*panipot*) is well below target, but even if fully collected would not have a significant impact on O&M funding

C.iv Institutions

- The WUAs at most levels have little role and are very weak – few people understand what they can or should do. They appear over-complex for their current function.
- At least 30% of the population are sharecroppers or tenants and thus not eligible for membership of water user groups. Some sharecroppers are however active in canal management
- There is no formal institution at tertiary level although there are several problems of water management and canal maintenance and some key decisions on operation need to be taken at this level (100-200 ha).
- The WUC (sub-secondary level) should take many decisions, but it has little administrative authority and has almost lapsed.
- The WUCC is a key level in the hierarchy as it is the only committee that is legally able to manage a bank account. The chairman is influential both locally and with SMIP.

C.v Agriculture.

- Almost the entire area is cropped with rice in the monsoon apart from small areas of jute (for domestic use). There is little scope for changing this, but there are practices that could reduce the overall requirement for water. The yield increase with irrigation is

small at present. Amongst the reasons for this is the low level of improved input use when irrigation supply is unreliable.

These observations indicate that the study intervention will need to address a range of structural (physical and institutional), social, economic, and agronomic factors if it is to improve the effectiveness of the water users' institutions.

C.2 Lessons Learned from other irrigation projects

A number of recently implemented irrigation projects in Nepal have included institutional and water management activities which can provide lessons for interventions under the present study. Among the most pertinent programmes are:

C.i On Farm Water Management Project (OFWM)

This project is part of the Nepal Irrigation Sector Project. It has been operating for approximately 3 years within small surface and groundwater irrigation schemes (40 to 200 ha). The project aims to strengthen WUAs and to assist individuals to improve agricultural practices on their own land holding. It also provides support for the physical improvement of watercourses.

An important element in project implementation is the establishment of Farmer Field Schools (FFS), based on the Integrated Pest Management (IPM) model. So far seven FFS have been operating under the OFWM project, although the programme is being expanded to 18 projects in 9 districts. Each FFS has twenty-five participants drawn from an average of 250 households. The school is conducted on a site which includes a main study plot, 2 *katthas* (0.067 ha) in size, on which participants conduct farmer-managed trials. Training is coordinated through a District Technical Team composed of two officers from the District Agricultural Development Office (DADO)[16] and two officers from the District Irrigation Office (DIO) or Ground Water Field Office (GWFO)[17]. Training is planned and implemented in a cycle of seasonal planning, training, monitoring and review. The same participants have attended each FFS throughout the period from its inception.

Initially the strongest focus in the FFS curriculum was on agronomic practices, but latterly there has been more attention given to on-farm water management. The programme implementers now intend to introduce an element of system management to the training.

The project experience to date can yield some useful lessons regarding on-farm water management techniques and ways of introducing these to individual water users. The project is making use of an FAO CD-Rom on "Guidelines For Participatory Training And Extension In Farmers' Water Management" which is a useful resource for the present study[18]. Another FAO CD-Rom, "Guidelines for Water Management and Irrigation Development"[19], has a useful section on Participatory Methods, which is useful for the present study.

C.ii Nepal Irrigation Sector Project (NISP)

This programme has been operating since June 2000 in the Western, Mid-Western and Far-Western regions of Nepal. It is the latest of a series of related projects which have gradually developed and

[16] a Subject Matter Specialist (SMS) and a Junior Technical Assistant (JTA),

[17] an Engineer and an Overseer

[18] Food and Agriculture Organization of the United Nations. April 2001. Guidelines For Participatory Training And Extension In Farmers' Water Management, Provisional version (PT&E-FWM). (Rome: FAO AGLW - Water Service of the Land and Water Development Division).

[19] FAO, Rome. 1996.

implemented improvements to small to medium-scale farmer-managed irrigation schemes. NISP covering the three western regions is to provide irrigation facilities to about 60,000 ha, but previous project have also covered other parts of the country[20] It employs local NGOs[21] to incorporate institutional development activities, especially the formalisation of WUA registration, in the rehabilitation programme for small irrigation schemes (averaging less than 100 ha). The regional NGO recruits one Water User Association Facilitator (WUAF) from each scheme, via the scheme WUA. Training is given to the WUAF rather than directly to the WUA or other users. Training focuses mostly on the formalities of WUA functioning such as adoption of a constitution and WUA registration, organisation management, regulations affecting WUAs, system operation and maintenance, accounting and financial management. The WUAF is employed by the programme up until the end of construction. As a local person, the WUAF remains in the community and is expected to be a resource for the WUA.

This programme indicates the benefits of using locally based NGOs and of training facilitators who are drawn from amongst the local water users.

It has also experienced problems with the use of standardised registration procedures and constitutions, and with maintaining the continuity and strength of programme-supported farmers' institutions after the end of rehabilitation activities.

A similar programme, the Second Irrigation Sector Project (SISP), is supported by the ADB in the Central and Eastern Regions of the country. This will be followed by the Community Managed Irrigated Agriculture Sector Project, which is currently under preparation and is expected to make significant improvements based on the experiences of NISP and SISP

C.iii Irrigation Management Transfer Project (IMTP)

This project was initiated in 1995 as a follow-up to the Irrigation Management Project of 1985. It covers the transfer of management responsibilities on medium scale irrigation schemes (typically 1,000-10,000 ha) that need greater support than those in the NISP programme. Under Phase I, between 1995 and 2001, work related to the development of water users' institutions was undertaken by the CADI consultancy in four sub-projects. The current Phase II institutional development programme, under the management of the NGO CARE/Nepal working in partnership with RITI/APTEC, is operating in 10 sites, primarily in the Terai.

The institutional development programme provides for activities to establish and train WUA executive officers above branch canal level. Under the Phase II staff structure, training is conducted by a cadre of locally based Institutional and Community Development Assistants (ICDA), supported by a specialist pool of trainers from CARE/Nepal and its partner. Over the period of one year, chairpersons participate in a number of 3 to 4 day training events covering topics such as leadership, conflict management, operation and maintenance and gender issues. WUA treasurers are offered courses of similar length in record keeping and account maintenance. A range of training manuals have been published for the training. The training is field based, uses local materials, and is conducted in the local language.

In addition, following the recommendation of a study of Women's Participation and Leadership Development in IMTP[22], the project also employs 27 female motivators who are drawn from the participating sites. The need for these motivators was identified in view of the failure of past measures to achieve a desirable level of involvement of women in decision making and equitable access to

[20] Irrigation Line of Credit (WB-supported), Irrigation Sector Project and Second Irrigation Sector Project (both supported by ADB)

[21] one local NGO was employed for each region.

[22] Dr. Samira Luitel, Gender Specialist. November 2001. "Women's Participation and Leadership Development in IMTP". Report to IMTP. RITI-APTEC consultancy (P) Ltd. In partnership with CARE/N.

irrigation water. The study found that there are educated young women present in irrigation schemes who are enthusiastic to work on community development activities.

The motivators are selected by their respective WUAs, although their payment is administered by CARE/N. The task of the motivators is to work with women individually and in groups to encourage them to play a more active role in irrigation management and in the collection of Membership and Irrigation Service Fees (something the study found women to be particularly good at).

C.iv Integrated Programme for Strengthening of WUOs and Water Management (Sunsari Morang Irrigation Project Stage III – Phase 1) (IP/SMIP)

This programme, initiated in June 2002, aims to achieve an integrated approach to improving the use of irrigation water. As with the On Farm Water Management Project, the IPM Farmers' Field School concept is being used as a model for "Integrated Crop and Water Management" Farmers' Field Schools (ICWM-FFS). These are being tested in a pilot programme of 12 schools (one school in each of 12 tertiaries) located in Stages I and III of the Sunsari Morang Irrigation Project.

Each school has an average of 25 to 30 participants (about one-fifth of participants are female), selected by the respective Water Users' Committee (WUC)[23]. A Farmer Trainer, trained under the programme, is responsible for looking after each FFS (4 of the 12 Farmer Trainers are female). Each school meets for one morning a week, on a fixed day, for 18 weeks (i.e. one season). During each session, participants combine action research on a 6 kattha (0.2 ha) field school experimental plot, with presentation of their findings, and discussion of special topics facilitated by technical specialists from DADO and SMIP. This programme has adapted a very effective participatory learning model, based on the principles of farmer action research, to bring together training in crop and on-farm water management practices.

This programme provides a useful base for the intervention activities to be implemented under the present study. The model is clearly a fruitful one, and relevant experience is being developed for conditions specific to Sunsari Morang. At the same time, there is room for improvement in a number of aspects of the field school approach, such as inclusion of training in water management beyond the farmer field, participant selection procedures to ensure equity, and formal mechanisms for ensuring that participants disseminate their learning to other water users.

C.v Community Groundwater Irrigation Sector Project (CGISP).

This project aims to develop privately-financed group-owned shallow tubewells. After a slow start, considerable progress has been made over the past year. A national NGO (for example, DEPROSC) manages the group formation process, and funds are lent to the groups through local banks or NGOs. Each tubewell is managed by a small informal group and serves 3-4 ha. Once there are about 15 project groups in a VDC this is registered as a formal WUA under the Water Resources Act. They also form informal 'project' groups of about 20 households for agricultural development activities.

C.vi Irrigation Development Project-Mid-western region (IDP).

This programme includes rehabilitation or development of irrigation in four districts, and has placed great emphasis on institutional development although it also involves a considerable amount of construction. The project is working in a part of the country which is particularly affected by the 'maoist' movement and this has severely affected the work that can be done. They have generally used training materials which have been prepared for other projects, such as IMTP. One interesting feature

[23] In SMIP the Water Users' Committee (WUC) operates at sub-secondary canal level.

is that they have set up women's groups in the command area for agricultural development, and representatives from these groups are elected to serve on the scheme WUAs.

C.vii Andhi *khola* irrigation Project (AKIP)

The Andhi Khola Irrigation Scheme was a pioneering project which attempted to make irrigation more pro-poor through an innovative process of land redistribution and allocation of water to individuals rather than to land. Irrigating 280 ha of previously mostly fallow or rainfed land, it is combined with a hydro-power project and was built between 1987 and 1996. By creating a system of water trading, poor farmers and even landless who were involved in construction could gain benefit from their rights to water. The evaluation report[24] (NSAE, 1997) concluded that "a remarkable users' participation was obtained in construction and O&M of this project… the concept of land distribution to the poor and landless farmers of the command area seemed to have left a good impression upon the poor community… the irrigation facility is reliable, adequate and equitable which has minimized the occurrence of conflicts". The farmers' organisation has been constituted after long interaction with the beneficiaries and it has been provided with training… the AKWUA is capable and responsive".

Although many of the benefits were sustained and it remains a successful project, a later study (IWMI, 2002[25]) found that some of the innovative features related to share allocation and water trading have lapsed. The relevance for the GGG project is, however, in its processes and difficulties in establishing the WUA rather than the other aspects of the project. The relative success achieved reflected the considerable effort that was put in to establishing the WUA on a strong and equitable basis, but some weaknesses were not resolved. Notably, IWMI reported that "*The better-off dominated in the Water Users Association Committees. Poor people are dependent upon these households for their livelihoods. This makes it difficult to enforce regulations or correct the behavior of the offenders.*" They also stressed the need to "*secure poor male and female farmers' effective participation in decision-making over water rights and obligations. This not only concerns participation in formal and informal meetings, but also participation in the various Committees. By doing so, poor farmers can better represent their interests in setting rules and enforcing rule compliance*".

IWMI concluded that "*Perhaps the most important lesson learnt from the experiences in Andhi Khola is that the core of any concept of pro-poor intervention should have agencies that directly communicate with the poor themselves, inform them, consult them, and empower them vis-à-vis the non-poor, throughout the project cycle*"

C.3 Lessons learned from other sectors

C.i Forestry:

The history of the "community forestry" (CF) concept in Nepal is particularly instructive for the development of resource user institutions, including WUAs. As one observer[26] has noted, from its beginnings in the 1970s, CF has gathered momentum and resulted in a "proud sense of ownership amongst Nepali foresters". Once appropriate Community Forestry and decentralisation legislation was put in place in the 1980s, several donor agencies have supported foresters, and others, to establish an approach whose value has been recognised around the world.

[24] Impact evaluation study of Andhi *khola* Irrigation system, Nepalese Society of Agricultural Engineers (NSAE), December 1997, Kathmandu

[25] Do Equal Land and Water Rights Benefit the Poor? Targeted Irrigation Development: The Case of the Andhi Khola Irrigation Scheme in Nepal, Jacobijn van Etten, Barbara van Koppen and Shuku Pun, IWMI, WP38 2002

[26] Don Messerschmidt. March 2002. "Strengthened Governance of Natural Resources and Selected Institutions: An Assessment for Planning." Unpublished report under USAID/Nepal's Strategic Objective No. 5 ('SO5'), p. 34.

Livelihoods and Forestry Programme (LFP) – is one of the donor supported programmes for the forestry sector. This programme, started in April 2001, builds on the lessons learned from the Nepal UK Community Forestry Project (NUKCFP) which ran from 1993 until 2001. Under the earlier programme, the focus was on the process of handing over community forests to Forest Users' Groups (FUG). The handover process has been led by government Forest Rangers who have ensured that each FUG complied with the formal requirements of establishing a constitution, registration, forest inventory, and development of an operational plan. The process aimed to be participatory and socially inclusive.

However, pressures on forestry staff to achieve handover targets often resulted in a standardised, sometimes inappropriate, blueprint approach to meet the formal requirements of handover. Government staff found themselves often overstretched and unable to provide satisfactory follow-up for the FUGs.

Under LFP, consideration is being given to how to build local capacity for the active management of forest resources. The programme is particularly concerned to ensure that the poor, the marginalised, and women are able better to assert their rights and improve group equity.

One of the programme components, starting in 3 districts in the Terai, is Participatory District Forest Management Planning and Programme Implementation. The process begins with a participatory baseline survey which will identify self-defined forestry interest groups. These groups will be facilitated to work with other stakeholders (eg. DDC, DFO, VDC Fed, DFUGs, other Government Organisations, NGOs and forest industry representatives) to develop and implement realistic and practical development plans. A participatory Monitoring and Evaluation (M&E) system is also put in place to support ongoing learning by people and institutions, with the aim of enabling them to take over the responsibilities of M&E on their own.

An animator programme has been piloted in the first year of LFP implementation. The role of the animators is to support Community FUG formation and post-formation activities such as encouraging the establishment of self-help networks and working with VDCs to encourage bottom up planning processes that are inclusive and address the needs of the poor.

In each district a local NGO has been appointed to manage the animation programme and provide animators with support in the field. A national NGO[27], has been contracted to train animators in partnership with the local district NGOs. The national NGO is developing an animators' handbook, as well as a trainers' guidebook. The training programme for animators includes an introduction to Participatory Leaning and Action (PLA) tools and techniques. These PLA tools and techniques are useful for baseline survey, interest group identification, action planning and participatory monitoring and evaluation.

The Livelihoods and Forestry Programme maintains a useful documentation centre, which includes a large number of case studies and other reports which can provide ideas on process documentation, as well as on the way that the handover process has been institutionalised within the Ministry of Forestry.

C.ii Rural Roads

Past experience with certain environmental and social side-effects of road construction has encouraged a shift in focus to "green" road development and sustainable livelihoods.

Rural Access Programme: this programme aims to promote a participatory approach to accessibility planning, and to give priority to the poorest in employment, literacy training, and improved access to services such as health and markets. The programme is initiating work in 6 districts. A Rural Access

[27] Samuhik Abhiyan for Responsible Civil Society.

Programme (RAP) team, composed of a Team Leader/Planner, a Social and Economic Development Specialist, and an Engineer, is assigned to each district. Each RAP team will recruit and train a local NGO to provide the local back-up for project implementation.

The programme is still in the initial stages of on-site activities. However, this sector is considering issues of equitable benefits to the poorest, as well as sustainable infrastructure operation and maintenance, which are also of interest to the present study.

C.iii Strengthened Governance of Natural Resources

The issue of strengthened governance is of particular concern to many stakeholders in Nepal, including government institutions, NGOs (local and international), and international donors.

USAID/Nepal's Strategic Objective No. 5 ('SO5'): Strengthened Governance of Natural Resources and Selected Institutions: USAID recently published a study which addresses this issue[28]. The study reviews a range of resource user programmes and community-based organisations, and concludes with 16 sets of recommendations: The issues covered include:

> (1) monitoring the management and distribution of benefits to stakeholders; (2) women's empowerment and literacy; (3) awareness raising and capacity building; (4) income generation; (5) enabling more involvement by poor and disadvantaged groups; (6) more user group mobilisation and development; (7) economies of scale; (8) sharing among user groups; (9) politics, elective responsibilities and good governance; (10) social capital-building among CBOs and with NGOs, federations, associations and cooperatives in civil society; (11) experience and observations in hydropower development; (12) continuity of project activities, and program/project duration; (13) collaborative planning and implementation; (14) documenting and disseminating lessons learned and best practices; (15) strengthening training and education in current development concepts; (16) enhancing applied social science inputs.

Nepal Participatory Action Network (NEPAN): this NGO aims to promote the use of participatory approaches which can make an important contribution to achieving the aims of good governance. The activities of the organisation include organising training programmes, workshops and networks, undertaking research, and publishing a regular journal, as well as training materials and other reports. NEPAN maintains a Resource Centre with a very useful collection of books, reports, films, slides and magazines. NEPAN has published a training booklet in Nepali, with the translated title of "PRA Concepts and Practices – A Training Guidebook", by Kamal Phuyal. Several copies of this booklet were supplied to the study team.

C.4 Summary of Lessons Learned

These programmes yield the following lessons, regarding the design of activities which aim to improve the capacity, equity and sustainability of water users' organisations[29]:

Participatory Planning

- the use of participatory learning tools and techniques is an effective way of initiating the process of baseline assessment and activity planning with a user community. This promotes the active involvement of the community in social analysis for interest group formation, needs diagnosis and activity planning. It also forms the foundation for future participatory monitoring and evaluation by the community (LFP, NEPAN).

[28] Don Messerschmidt. March 2002. ibid. see footnote 26.

[29] The acronym of the project or programme from which each lesson is drawn is shown in parentheses.

Training Programme Timetable and Content

- the Farmer Field School (FFS) concept, which uses a participatory learning approach and incorporates farmer managed research on a dedicated site, is an effective "entry point activity" to improve the governance of water users' organisations ((OFWM, IP/SMIP)[30];
- it may be better to have regular FFS sessions rather than fixing activities on an *ad hoc* basis throughout the season (OFWM, IP/SMIP);
- sufficient time and resources must be allowed to provide trainees with effective training and follow-up (NISP);
- water management training has tended to focus on-farm, within the individual holding. The FFS curriculum needs to be extended to incorporate content which links on-farm considerations with co-operation, operation and maintenance, at successive levels up the system, from field channel, to water course, tertiary and above (OFWM, IP/SMIP);
- in support of the above, the curriculum should also address questions of good governance of water users' institutions at each level, and develop participants' skills in promoting this (IP/SMIP, NISP).

Participant Selection

- participants should be selected in a way that reflects a representative range of interests, such as position within the watercourse (Head, Middle, Tail), gender, and well-being/poverty status (OFWM), (IP/SMIP, AKIP, LFP, RAP);
- while most IMTP training has addressed higher executive levels in the WUA structure, this should be complemented with bottom-up interventions beginning at the WC level (IMTP);
- it is best not to retain the same participants over an extended period of time[31](OFWM).

Demonstration and Information Dissemination

- there should be an explicit mechanism, or "platform", for FFS participants to promote information dissemination and skills transfer to other water users in their group (OFWM, IP/SMIP).

Female Facilitators/Animators

- there is scope for the recruitment of female facilitators to work with women individually and in groups to promote improved involvement of women in water user issues (IMTP).

Training Resources

- there is a large range of resources on participatory approaches, tools and techniques which can be usefully adapted to this study intervention. NEPAN has published a training booklet in Nepali and it maintains a useful documentation centre (NEPAN);
- there are two FAO CD-Roms which cover material of relevance to on-farm water management, agronomy, irrigation system operation and maintenance, as well as the application of participatory processes and methods to the irrigation sector (OFWM);

[30] An "entry point activity" is an effective way to stimulate local interest, give local people implementation experience and confidence, and promote ownership and sustainability of the institution. For example, early on in its work in a community, the Community Based Economic Development Project, implemented by CECI/Nepal, promotes group formation by supporting a small activity that meets a community felt need. The execution of this activity by the community helps the process of group formation by giving the participants experience of working together to manage resources for a tangible outcome.

[31] In OFWM it was observed that after repeated involvement in the FFS participants began to loose interest.

- CARE/N and its partner have prepared a large volume of training materials that could be a useful resource for interventions in the present study (IMTP);
- the Livelihoods and Forestry Programme also maintains a documentation centre which contains materials which can be of use to the study team (LFP).

Institutional Linkages

- an important contributor to the success of community-based resource management is a sense of commitment to the concept and pride among all stakeholders, including line agency officers and politicians (LFP, SO5);
- local NGOs and animators should be trained and able to help water users to organise themselves to access local service providers and input suppliers (including higher level WUAs, line agencies, NGOs and CBOs), and to organise themselves for income generating activities (LFP).
- engineering officers should have an active role in the FFS programme, such as leading training sessions in water management-related topics (OFWM).

WUA Regulations

- the format and regulations for registration and constitution of WUAs should be flexible and accommodate traditional values, norms and practices (NISP, LFP, SO5);
- users' organisations which have been formed in a standardised way to meet implementation targets are likely to be weak. They will often need an added stimulus to make them active, and to have the genuine participation of all stakeholders (LFP, many JM/AMIS irrigation schemes, SO5).

Sustainability

- locally recruited NGOs and facilitators/animators should be used as much as possible to promote bottom-up planning and sustainability (IMTP, NISP, IP/SMIP, LFP, RAP, SO5).
- there should be clarity about who will be responsible for continuity of activities after the NGO withdraws (NISP, LFP).

Appendix D: Table of Contents for DL/AP Report

1. Introduction
   1.1 Background to the Study
   1.2 Methods

2. System Overview
   2.1 History
   2.2 Settlement and social history
   2.3 Institutional Development
   2.4 Agriculture

3. Social Overview
   3.1 Household Information
   3.2 Social Structure
   3.3 Land Distribution and Land Tenure
   3.4 Employment
   3.5 Mobility and Migration
   3.6 Cultural practices
   3.7 Inter-Relationships of Settlement Pattern, Social Characteristics and Irrigation

4. Natural Resources
   4.1 Irrigation Water Supply
   4.2 Land
   4.3 Energy
   4.4 Implications for System Management

5. Infrastructure
   5.1 Canal System
   5.2 Drainage
   5.3 Roads and Access
   5.4 Implications for System Management

6. Agriculture
   6.1 Cropping Pattern, Intensity and Yields
   6,2 Soil type and fertility
   6.3 Agricultural Inputs and Practices
   6.4 Agricultural Labour
   6.5 Implications for System Management

7. Water Management
   7.1 Operation
   7.2 Maintenance

8. Institutional Development
   - 8.1 Structure
   - 8.2 Functions and Activities
   - 8.3 Leadership
   - 8.4 Representation and Participation
   - 8.5 Rules and Regulations
   - 8.6 Decision-making Process
   - 8.7 Communications Systems
   - 8.8 Resource Mobilisation and Management
   - 8.9 Conflict Resolution
   - 8.10 Linkages and Co-ordination

9. Action plan

Appendices

Social and resource maps
Household profiles and land data
Well-being ranking
Mobility mapping
Transect Maps and notes
Time line
Time trend analysis
Seasonal calendar
Venn diagram
Gendered task analysis
Water use matrix
Key informant interview notes
Focus group discussion notes

Appendix E: Standard Matrix for Performance Monitoring

Water Users Associations
Governance and Performance Assessment Criteria

Governance Indicator	Standard		
	Poor	Moderate	Good
	0	1	2
Appropriateness of structure			
Consistency with policy (nature of WUA, level of decentralization etc)	Not in accordance with policy	WUA established but only at low levels	Fully consistent, legally sound
Corresponds to hydrologic requirements	No relation	Partially related	Fully logical relationship
Corresponds to social /political requirements	No	standard but some traditional practices incorporate in design	tradition, scale, complexity and diversity of tasks considered in design
Representation / Participation			
Participation in institutional design	None	Aware of institutional development	Participated in preparation of constitution
Elections held as per constitution	Never	Held, but less frequently than specified	Yes
Chairman locally resident	No	Yes, but not farmer	Yes and active water user
Representation of women in WUA	0	nominal representation on committee	Effective representation on committee
% stakeholders eligible for general membership	<50%	50-75%	>75%
% general members who participate in O&M	<50%	50-75%	>75%
Clarity/awareness of roles			
WUO responsibilities defined	None	Informal / incomplete	Documented
Members aware of WUA role	No / inaccurate knowledge	Partial	Full awareness and agreement
Gaps or overlaps with other levels of mgt	No agreement	Exists but inconsistent, ignores relations with other WUO at same level	Logical formal agreement
Relation with other agencies (Village etc)	None	*ad hoc*	Formal relations
Authority			
Legal status	None	Sufficient but registration lapsed	Legally constituted
To collect/manage resources			
financial	None	Collects fees but limited authority	Full authority to set fees etc
non-financial	None	Can arrange some maintenance	Regular system for resources
To take decisions			
operation	None / individual / other agency	Informal group of majority of users	WUO, in accordance with constitution
maintenance	None / individual / other agency	Informal group of majority of users	WUO, in accordance with constitution
To impose penalties on members	None	Dependent on VDC or others	Full authority
Ability to influence higher level management	None	in emergencies only	Regularly monitors and co-ordinates
Accountability			
Approval of decisions	None	Agreed by committee members	Ratified by general meeting
Approval of finances	None	Agreed in general meeting	External audit
Rights of appeal	No rights	informal / inconsistent systems	Well-defined systems
Transparency			
Meetings held	None	1 per year with < 50% attendance	1 per year with > 50% attendance
Awareness of decisions	None	Anecdotal knowledge	Minutes prepared
Availability of and access to data	None	List of members only, with WUO only	Up-to-date agreed list - members/land
Awareness of rules and systems	None	25 - 50% farmers aware	More than 50% aware and agree
Finance	No records	Incomplete records	Systematic records
Aggregate Governance Status of Water Users' Association			

Water Users Associations
Governance and Performance Assessment Criteria

Performance Indicator	Standard		
	Poor	Moderate	Good
Operation			
Pre-season planning	None	Some crop or water planning, but incomplete	Agreed crop plan and water delivery schedule to suit
Water supply in accordance with plan	Not monitored	Monitored by WUO, but not consistent with plan	Monitored and in accordance with plan
Main system supply	Not monitored, poor match with schedule	Not monitored, fair match with schedule	Monitored, co-ordination with DOI for action
Maintenance			
Routine	not done	Routine cleaning / repair of damage	Maintenance planned / implemented
Emergency	not done	Temporary repairs, no follow-up	Permanent repairs done later
Finance / Resources			
Collection performance	<60% of fees set	60-90% of fees set	>90% of fees set
Adequacy of resources	inadequate for routine purposes	Covers routine O&M and able to respond to emergencies	sufficient for all O&M
Internal Conflicts			
Conflicts related to contribution of resources	unresolved	resolved but needed external mediation	resolved by WUA, and accepted by users
Conflicts related to distribution of water	unresolved	resolved but needed external mediation	resolved by WUA, and accepted by users
External Conflicts			
Control of theft by members from other canals	None	minor, resolved by WUO	Fully controlled
Equity			
Water supply to tail of canal	<75% cf average water supply	75-95% cf average water supply	>95% cf average water supply
Aggregate Performance of Water Users' Association			