China – UK, WRDMAP
Integrated Water Resources Management Document Series

Thematic Paper 6.3/1: IWRM, Irrigation and its Social Context

May 2010

6. Water Saving Society

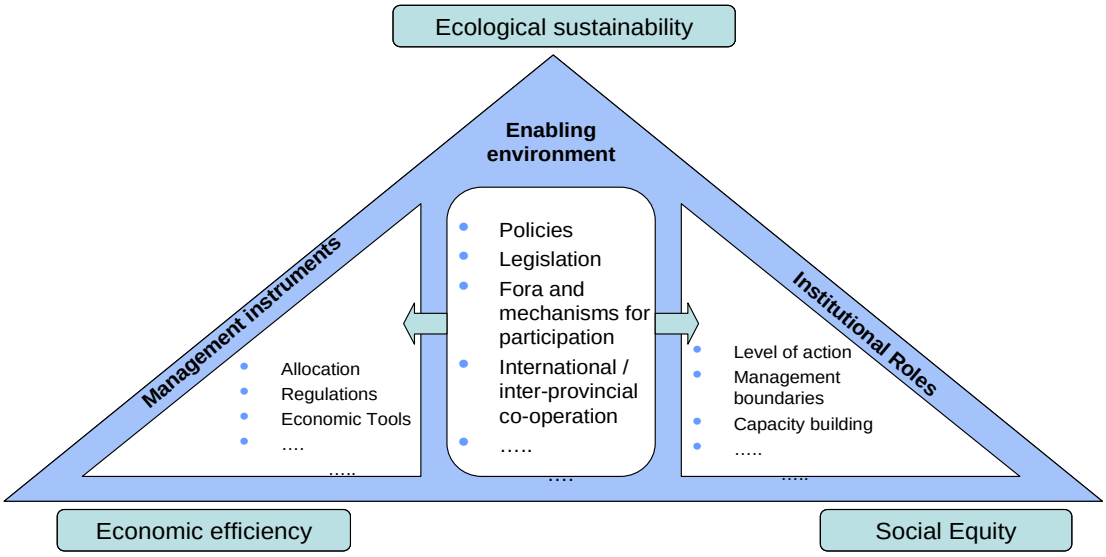
中国水利 CHINA WATER

DFID Department For International Development

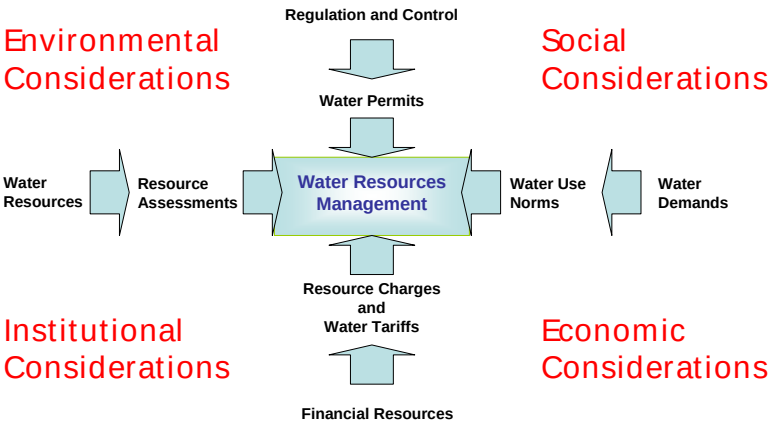
Mott MacDonald

Integrated Water Resources Management (IWRM)

(Based on Global Water Partnership)



Driving Elements of Integrated Water Resources Management



(Second figure after WRDMAP)

Summary: The objective of this Thematic Paper is to review the social issues surrounding IWRM. Social equity is one of the three pillars of IWRM, along with economic efficiency and environmental sustainability. Although the social context is very important it often receives less attention in practice than it should. The most vulnerable users are poor farmers who collectively use more water than other sectors and are most dependent on this water for their livelihoods.

The document provides an overview of how the interests of users can be incorporated in water management, through participatory processes at the local level, and with representation of at river basin level. It is essential that this process should be mainstreamed by water managers e.g. those within the water affairs bureaus, and not an 'add-on' to be addressed incidentally by external groups such as social researchers.

The structure of the Thematic Paper is as follows:

- Understanding social issues
- Promoting participation at a local level
- Promoting participation at river basin level
- Protection of livelihoods through IWRM

This document advocates greater participation by local stakeholders. It is aimed at the staff of the Water Affairs Departments and Bureaus at from Provincial down to County levels to help introduce social concepts and necessary considerations in a more rigorous way than has been done in the past. This should help them introduce socially equitable water management.

The Ministry of Water Resources have supported the Water Resources Demand Management Assistance Project (WRDMAP) to develop this series to support WRD/WAB at provincial, municipal and county levels in their efforts to achieve sustainable water use.

1 Introduction - Social Context of IWRM at River Basin Level

1.1 What is IWRM?

Integrated Water Resources Management (IWRM) aims to promote the "*co-ordinated management and development of water, land and related resources*". It is not an end in itself but a means of achieving three key strategic objectives:

- efficiency to make water resources go as far as possible;
- equity, in the allocation of water across different social and economic groups;
- environmental sustainability, to protect the water resources base and associated eco-systems.

The concept of IWRM arose from the influential Dublin Principles which were agreed in 1992 and which recognise the fundamental importance of an improved approach to water resources management. (See the Overview Paper on IWRM in this series for more details of the overall concepts). All four of the 'Dublin' principles have important social implications.

- Fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment
- Water development and management should be based on a participatory approach, involving users, planners and policy-makers at all levels
- Women play a central part in the provision, management and safeguarding of water

- Water has an economic value in all its competing uses and should be recognized as an economic good.

These principles all indicate the central place that social issues should have in water management. The greater the stress on water resources, the more people, particularly the most vulnerable and poorest sections of the community, will suffer from unfair access to water. As resources become over-exploited, difficult choices need to be made between alternative uses of increasingly scarce water, and additional costs may be incurred in protecting the quality of water.

IWRM thus requires that there should be sound information on the interests of all stakeholders and a suitable mechanism for ensuring that these interests are actually taken into account.

This requirement for stakeholders to participate in IWRM is frequently advocated (see, for example, Rogers and Hall 2003), but achieving substantive stakeholder representation (including the poor) in river basin management has proven extremely difficult in most countries, as Molle (2007) has demonstrated. This paper on social issues in IWRM and the parallel paper on stakeholder participation in this series (TP2.2) attempt to learn positive lessons from the experience so that they can be applied more widely.

It is, however, very important that the social objectives of IWRM are understood and satisfied. This is because of both:

- The scale of the problem and the critical importance of water for livelihoods; and
- The diversity of interests (ranging from high value uses by influential industrial stakeholders, to low value uses by marginal stakeholders with few alternative livelihood options).

1.2 Practical difficulties in taking account of social issues in IWRM

It is easy to state that social issues should be paramount, but rather more difficult to put this statement into practice or to define what it actually means in practice. This document aims to give practical guidance on ensuring that social considerations are properly addressed.

Social equity is one of the three pillars of IWRM, along with economic efficiency and environmental sustainability. Although the social context is very important it often receives less attention in practice than it should. This is partly because of the highly technical nature of many aspects of water resources management, and partly because of the large numbers and very varied viewpoints of different users.

To give a few examples of the problem in the broader water resources management context, the first National plan on IWRM in Kazakhstan includes numerous references to importance of integrating social issues, but provides no guidance on how this should be done – beyond stating that there is a need for increased demands for domestic water and for recreation, and that irrigation efficiency needs to be improved. (http://waterwiki.net/images/1/16/First_Draft_of_National_IWRM%26Water_Efficiency_Plan.pdf).
Similarly, Peter Jørgensen also makes the point that there is little

consideration of socal factors in IWRM in Burkina Faso.

The most vulnerable users are poor farmers who collectively use more water than other sectors and are most dependent on this water for their livelihoods, but who produce the lowest returns in terms of GDP per unit water consumed.

Addressing social issues at individual project level is relatviely straight-forward, but the main challenges of IWRM are in addressing these issues on a larger scales – sharing water between irrigation districts, or between sub-sectors. Even within rural areas there can be conflicts between forestry, agriculture and pastoralism, but more complex problems arise in rural-urban water-sharing – such as between irrigation and manufacturing industry. Farmers do not want to give up valuable water for the industry, but they also want employment within the industry and access to the products made by it.

It is easy to see why these problems may be neglected. Firstly, these relationships are extremely complex and they affect different groups of people in different ways, and secondly resolution of these conflicts requires co-ordination at a high level. Few stakeholders are able to participate effectively at this high level, and the most vulnerable people are the least likely to participate. In practice, therefore, most of the key decisions are usually taken by technical specialists and the local or national government. These high-level stakeholders will take account of the local interests in varying ways, and the challenge is to ensure that these decisions are made soundly with due consideration of all socio-economic factors that exist or might result.

This document advocates greater participation by local stakeholders through representative arrangements so that local social issues can be addressed explicitly in the specific area of water management related to rural water use. (Issues of water quality management, urban water management and flood management etc are not considered in this document).

A separate document (TP2.2) considers the institutional approaches for stakeholder analysis and participation, whereas this document focuses on the social issues which need to be addressed.

1.3 What are the social issues?

There are many areas where livelihoods are directly and strongly affected by water conditions. These might include, for example, situations in which households:

- have unreliable access to water for the cultivation of food or there is conflict over access to this water;
- have to spend a high percentage of their time or income on water (whether for domestic consumption or for irrigation);
- are influenced by developments further upstream which affect them, but over which they have little knowledge and less influence; or
- are threatened by environ-mental degradation as a result of over exploitation of water resources (which in turn they may be contributing to).

Traditionally these local social problems were not at the heart of decision-making in the water sector. Instead, water issues were dealt with on a fragmented basis, with (at best) a social assessment of the impact of investments in industry, urban water supply, flood control or irrigation. This approach, however, neglected the inter-relationships between sub-sectors and meant that social priorities were not reflected in the overall management of water resources.

There can be multiple benefits to society if an integrated approach is taken to resolving these problems. For example,

- more reliable irrigation can result in greater food production of higher quality, and hence better nutrition, greater resistance to disease, and employability.
- water for industry can increase employment, reduce the dependence on smallholder agriculture, increase household income and education standards as well as affordability of urban water supplies.

Water resources management can thus have strong social benefits, but there is also much that can go wrong, with inequitable access to water, inadequate supplies for vulnerable groups being common problems.

1.4 When should social issues be considered?

From the user perspective it is their actual access to water of adequate quality which is most important, rather the processes at each stage of the project cycle (planning, design, implementation and management).

However, the users will need to be involved and social issues considered in varying ways at all stages, The processes differ according to the stage.

- *IWRM Planning,* which will include synthesis of all sector plans related to water, prioritization of structural and non-structural options to ensure sustainable water resources. Good social data, analysis and participation is needed to understand the issues and ensure that they are addressed in the plan. This is the focus of Sections 2 and 3 of this document.
- *Design of structural options* (such as new or improved water delivery systems). These will have many social impacts which will need to be considered in a feasibility study to ensure that social benefits are maximised and any adverse impacts mitigated (compensation is often an important issue). This is not described in this document but is covered in outline in other documents in this series (particularly OV1, AN2.1 and EG2.1).
- *Implementation of these water resource development works*. Arrangements should be set up so that social problems can be addressed as they arise. This is also only outlined in other documents.
- *Management* - long term sustainable management (also referred to as *IWRM implementation*). This is the focus of Sections 4 and 5 of this document.

1.5 How can the issues be addressed?

This document outlines approaches for tackling these issues. These require:

- Enhanced participation at local level within a sub-sector or project, building on existing successful experiences (both traditional and modern)
- A focus on gaining detailed understanding of local issues and their inter-relationships
- Ensuring that high-level stakeholders are aware of the issues and recognise their importance
- Improving coordination between stakeholders to ensure a common understanding and a willingness to compromise (considering both institutional arrangements and technical tools and models for optimization)
- Achieving effective represen-tation by local stakeholders in the higher level processes
- Promoting public awareness of the wider issues around sustainable water resources management and the need for compromises.

There is a great deal of literature and an accumulation of experience on the practicalities of social aspects of water management at the local level within a particular context – notably rural water supplies and small-scale irrigation – essentially covering the first bullet point above.

This document does not attempt to synthesize all of this experience, but aims to draw some conclusions from the way in which social issues have been incorporated at a local level in China to date, how this process could be improved, and then to make suggestions for how these factors are reflected in river basin management – ie to address the subsequent bullet points above.

2 Understanding Social Issues - Surveys and Participatory Assessments

2.1 Introduction

Understanding people's needs and addressing these problems depends on a thorough and detailed understanding of the local situation. This in turn relies on collection of socio-economic data (both baseline and periodic updates), and effective participation by local stakeholders.

This information is needed particularly at the planning stages of a programme, but it continues to be important throughout implementation and monitoring

Few would disagree with the need for some socio-economic data, but there is less consensus on how it should be collected, and how much participation there should be. Social scientists will stress the need for detailed local investigations; whereas water resource professionals and WABs may be content to rely on existing secondary information collected by others combined with their own personal observations, anecdotal feedback and understanding gained through decades of practical experience with managing water.

This section advocates a systematic approach drawing on socio-methodology and mainstreaming this

into normal practice by WABs. It should not normally be necessary to commission socio-economic surveys, but it is necessary for WABs to become more sensitive to the subtleties and local variations in social conditions, and also to the methods which have been developed for resolving these problems.

Sound, reliable data is important for assessing whether policies are working. For example, what will be the social impact of tariff reform? What will be the likely impact of permits and fees on different types of households? Unless these impacts are known, it is not possible to know if households can afford the fees we are suggesting. Once we understand the potential social impact of fees, permits and tariffs, we can design safeguards to protect the livelihoods of households.

Socio-economic surveys are the traditional and generally the simplest way of collecting data. The approach is relatively well-understood and much relevant data is already collected (particularly at township level in China). However such surveys are intrusive, extractive and do not always yield a reliable understanding of the situation – it is difficult to ensure quality of the data or that it is representative of the community. Many organisations see little value in this process, and many individuals resent being asked to provide this information, which they do not see being used for their benefit.

For this reason participatory methods are increasingly being used. This gives better ownership of the process, better understanding of why it is being done, and usually more reliable data. There may be some drawbacks, such as difficulties in gaining statistically valid qualitative data, and they may take longer or require more skilled personnel to train communities initially. If this is the case a combination of methods is recommended.

2.2 Surveys

Understanding socio-economic conditions and assessing the potential and actual impact of changes in water resources management on people's and communities' livelihoods depends on collecting relevant data, via the use of surveys and assessments. These also enable an understanding of knowledge of, and attitudes to changing water conditions. Collecting data regularly during the implementation of a programme or project also enables monitoring of its impact. This ensures a knowledge of change and of what works and what doesn't, to distinguish between effective and ineffective measures within programmes, and to improve programmes to make them more effective. The process of socio-economic monitoring is described in general in AN6.3/1 and in relation to agricultural water management in AN6.3/2. This section provides a brief overview on the basis of those documents.

Baseline data

The first step in understanding socio-economic conditions is to collect a set of basic, "baseline" data on livelihoods, in relation to water conditions. The information collected will depend on the nature of the plan, programme or project, but will normally include:

- Relevant water sector information –such as water use by group, quality of water service, availability, water prices, affordability of water, factors effecting water price, economic efficiency of water.

- Socio-economic information – such as demographic information about a local community, its social and economic organisation, information about households.
- Issues of local concern –issues that people feel strongly about. Such information can best be obtained by working with stakeholders with a sound knowledge of local issues.

In irrigated areas, a socio-economic baseline is needed in relation to access to water and to water management arrangements, notably through the development of water user organisations. A typical baseline dataset would aim to:

- *Describe the main features of the village and its households*: population, household numbers, and features of the labour force. Since male out-migration is often important, the baseline should cover numbers of migrant workers (short and long term), numbers of households where women managed irrigation, and number of female-headed households.
- *Collect data on household income and expenditure*, divided into its components (income from crops, livestock, forestry products, remittances, and expenditure each year in areas such as education, health, and water). The impact on poor households is particularly important, so the baseline should include their numbers (for example the numbers living below the provincial relative poverty line, or those in receipt of *di bao*).
- *Collect agricultural production data* should cover village area, types of irrigation, areas devoted to the cultivation of each crop, yields, prices, net profit per crop, livestock numbers, value of livestock production and market access.
- *Collect water data* includes details by specified use (domestic, different types of irrigation, use by rural enterprises) and sources of supply, combined with water price data (fees, operation and maintenance costs).
- Given the importance of the development of *water user associations* (WUAs) and their role in water saving, the baseline should specify WUA membership (eg: number of male/female members, election of committee and leaders, regularity of meetings), procedures (approval of constitution, number of dispute resolutions), financial management and water management (use of abstraction permits, norms established for water use, agreed system for managing water, etc).

For each aspect, a suitable indicator was selected. Data for each indicator in the baseline can be compared with the values for the same indicators in subsequent years as a means for assessing trends in household income and expenditure. An example of a set of simple indicators recently used in six villages in the Shiyang River Basin in Gansu is presented in Box 1.

Box 1: Indicators used for villages in Gansu during the WRDMAP project

This project covered six villages / WUAs in Wuwei, Jinchang and Minqin Counties in Gansu province. The indicators used were:

- Average gross income (Y/pers/year)
- Average net income (Y/pers/year
- Average household income by category
  - agriculture (Y/pers/year
    - field crops - flood irrigation %
    - field crops - drip/sprinkler irrigation %
    - greenhouse crops – drip irrigation %
  - Livestock (Y/pers/year)
    - large livestock %
    - poultry %
  - Forestry/forestry products (Y/pers/year)
- Remittances from migrant family members Y/pers/year
- Other income (Y/pers/year)
- Total income (calculated) Y/pers/year
- Average expenditure (Y/pers/year) on:
  - Education
  - Health (medical costs)
  - Water
- Average expenditure a % of income
  - education
  - Health
  - Water

Normally this data would be collected directly from a sample of individuals for statistical analysis, but in this case aggregate data was either collected by working with the village leader and accountant, or derived from data already collected by the accountant. In some cases, there was also a reliance on data collected at the township level, notably by the statistics bureau. This was simpler and deemed sufficiently accurate for the purpose.

The data was collected, by recall, for 2005 and for each subsequent year up to 2009 so that the data could be tabulated, trends deduced, and the main conclusions presented in an annual report used to inform potential improvements to the water management system. Recall data for 2000 was also obtained, in order to gain an impression of long term trends at the start of the project.

Ideally, each indicator should include the following elements:

- Specified target group to which the indicator will be applied;
- Specific Unit(s) of measurement to be used for the indicator;
- Specific Time Frame during which it will be monitored;
- Reference to the baseline as a means of comparison;
- Defined qualities – for example: what is meant by using terms such as "adequate, "effective" "successful" as a part of an indicator.

Indicators designed should be "SMART": **S**pecific, **M**easurable, **A**ttainable, **R**elevant and **T**ime-Bound. For example, for measuring the number of small enterprises set up by women in a rural area during a particular period of time, an indicator stating "enterprises set up, particularly by women" is too vague. A more precise and effective indicator might be, "The number of new enterprises started in the year by female-headed and male-headed households in rural area X". The more precise the indicator, the less likely will be the possibility of misunderstanding occurring among those collecting the monitoring data.

Monitoring social impact

Data related to the same indicators in subsequent years can be compared with the baseline data to monitor and evaluate change resulting from and relating to implementation. Without such indicators it is not possible monitor systematically the achievements, progress or impact of plans, programmes or projects.

Box 2: Lessons from socio-economic surveys in Gansu

Some risks include:

- Avoid using more indicators than are necessary, and which may be difficult to collect accurately, not important for the analyses to be done, or not relevant for the local situation
- Ensure clear definitions of the meaning of indicators – for example the distinction between off-farm employment and migration. This was important in the Gansu case where local off-farm employment is substantial in some of the villages, whereas in others longer-term migration is more important.
- Ensure that those collecting data understand adequately the value of the data and how it can assist them in promoting water savings and water management.

The type of data generated is extremely useful for planning water management activities, but for many it was seen as yet another task to be implemented. This highlights the importance of communicating effectively the specific aims and objectives of the data collection, and the benefits of its subsequent use. Since one of the aims was for data collection to continue after the project period, this was an important issue.

2.3 Participatory monitoring

Both in China and internationally, it has been argued that commitment to monitoring – and indeed the task of monitoring itself - can be improved by a greater participation by primary stakeholders such as water users who both benefit directly from the project and who also are being monitored.

Participatory monitoring widens involvement in monitoring away from those who are managing water to a broader group of stakeholders. By building on local community knowledge, it increases the capacity of monitoring to record and analyse local conditions. A further purpose of giving communities an active role in monitoring and evaluation is to enhance communication and learning for improved performance and long-term sustainability of water resources.

In participatory monitoring, the inclusion of many stakeholders with different interests is the axis around which the monitoring process revolves, as people together analyse the process of plan, programme or project implementation and devise agreed and appropriate indicators. The different stakeholders discuss and agree what will be monitored, and how and when data will be collected. This process strengthens people's understanding of the project and – usually- strengthens their commitment to it. In participatory monitoring, groups of stakeholders:

- Discuss and agree on what areas are to be monitored
- Select indicators for monitoring
- Collect data
- Have access to the results of the data collection.

The various elements and principles are described in Table 1.

Participatory monitoring has been developed in several projects in China, notably in a recent Poverty Alleviation Programme in Jiangxi Province (see Box 2).

Participatory monitoring is one aspect of stakeholder participation which is described in the next section.

Table 1 Principles of participatory monitoring

Participation	Primary stakeholders and particularly local communities are active participants, not just sources of information. They are involved in selecting indicators and can have access to the results of this monitoring.
Discussion and negotiation	Relevant primary and secondary stakeholders should discuss, negotiate and agree what will be monitored, how and when data will be collected, and how findings can be shared.
Learning and capacity building	Participation and discussion can lead to collective learning. The focus should be on building stakeholder capacity for analysis and problem solving.
Flexibility	Since one of the purposes of participatory monitoring is improved results, leading to ongoing change, adaptation and improved implementation, flexibility is important. Indicators cannot be imposed but must be the result of stakeholder discussion.
Ownership and appropriate action	Communities have access to the data obtained by the participatory monitoring.

Box 3: Participatory monitoring in Jiangxi Province

In order to monitor and evaluate Village Development Planning in the Chinese 2001-2010 Poverty Alleviation Programme more effectively, a Sino-German Project developed a dataset and indicator system for the Jiangxi Poverty Alleviation and Development (PADO) Office. The indicator system was developed with participation by representatives from some of the villages being monitored. The villagers also worked with local officials in collecting data. The process was supported strongly by the Leading Group on Poverty Alleviation and Development (LGOP), and also used international experts. The monitoring system developed comprised input, output, outcome and impact indicators. These indicators measured social, economic, ecological and political aspects The monitoring took place in a sample of 1800 villages.

Changed Attitudes as an Outcome of Participatory Monitoring

Through their involvement in participatory monitoring, local officials have developed a new understanding of the local community. Examples of this change are:

- From lack of trust in the analytical abilities of the community to acknowledgement and respect. “When they started participating in PM, some officials thought that villagers who were poorly educated could not think about their lives. Conducting PM would only waste time and resources in communities. However, as the work progressed, the attitudes of township and county project staff changed. “During the course of analysis, we came to fully respect and trust local people’s knowledge and abilities….The results proved that the community have all the abilities to analyse their own problems”.
- From being unwilling to communicate with the community to learning from them, and listening attentively to their wishes. “At the very beginning, some people believed it
- was sufficient to consult a few village cadres, and that there was no need to do a very detailed job. However after being in the village and establishing good communication with the villagers, county and township project staff discovered they had gained a lot of knowledge from the community, and collected a lot of information. We learned how to learn from the community and listen to their voices”
- From being afraid of empowerment to letting local people make decisions by themselves. “Before implementation of PM, some people were worried that the community would not use their new rights to monitor. However after a while, we noticed that the community had all the abilities to handle all kinds of conflicts of interests, and make practical and feasible plans”

Write-up of his experiences of participatory monitoring during the implementation of the World Bank/Chinese Government *Pro-Poor Rural Communities Development Project*, by Zhou Zhifei, local official, Banqiao Township, Rongan County, Guangxi Province, 2004.

3 Participation

3.1 Introduction

Experiences of water resources management in China and internationally show that it is more effective and sustainable when it involves consultation and participation. Summarising the main findings from these experiences, it can be concluded that:

- Enhancing participation strengthens local support and contributes to a sense of ownership by communities.
- WRM can be more appropriate and responsive to beneficiaries needs if stakeholders are consulted. it is less likely that important issues will be misunderstood or neglected.
- Participation by stakeholders enables essential management activities (such as monitoring, inspection and fee collection) to be carried out more effectively and economically through co-operative efforts and burden sharing.
- Participation also reduces the risk of failure, through addressing possible risks and conflicting interests via stakeholder consultations.
- Management decisions taken unilaterally by a regulatory agency without social consensus can make it more difficult to implement a project - the quality of decision-making and of management should be better if there is wide consultation.
- Participation should ensure that all stakeholders are aware of the basis for decisions, have an opportunity to participate, and are not discriminated against.

These international experiences are borne out by recent work in Gansu. This led on to consideration of two important questions:

- How best to work with communities and their organisations to manage water resources?
- How to promote both their participation and that of other stakeholder groups whose involvement is vital for the successful implementation of water resources management?

Through attempting to resolve these questions, guidelines have been prepared on how to carry out and use a stakeholder analysis for water resources management. These guidelines address the following questions, central to undertaking a stakeholder analysis:

- What do we mean by stakeholders?
- How do we assess the importance of the various stakeholders involved in water resources management?
- How can we use a stakeholder analysis to decide if and when stakeholders should be involved in the design and implementation of plans, programmes and projects in WRM?

Much more detail about stakeholder analysis and participation in IWRM is presented in TP2.2. This section summarises some of the key aspects of that document.

3.2 Stakeholders: definitions

A stakeholder is any person, group or institution that has an interest in a plan, programme or project and its implementation. This definition includes intended beneficiaries and intermediaries, those who will be positively and negatively affected, and those involved in decisions on the management of water resources.

Stakeholders include the beneficiaries and intermediaries of water resources, as well as those involved in the decision making process.

In the water sector, the term stakeholder includes both the end-users of water and other individuals and organisations involved in management of water. Water affairs bureaus, agriculture bureaus, environmental departments, for example are all stakeholders.

For example, if a project is concerned with the use of groundwater, stakeholders are those who have an interest in the resources of a specified aquifer. This may be because they use groundwater, or because they are engaged in activities that could cause groundwater pollution, or because they are concerned with groundwater resources and environmental management. Additionally, since surface water should be managed conjunctively with ground water, and municipal or industrial wastewater may pose a threat to ground water quality, stakeholders should also include municipal and industrial representatives.

To understand the impact on and involvement by stakeholders in water resources management, stakeholder groups can be categorised into:

- Primary stakeholders: those groups affected directly by implementation; they can be affected both positively and negatively.
- Secondary stakeholders: those groups whose livelihoods are not affected directly, but whose influence can have a significant effect on the outcome of the management of water resources.
- Key stakeholders: those groups who are crucial for achieving plan, programme or project outcomes in water resources management.

Categorising stakeholders into these groups enables us to make an initial attempt to assess which will be the most important stakeholders, and how we can directly and indirectly influence particular groups. To take this further, we need to assess in greater detail how different stakeholders will be involved in design and implementation, how their involvement will affect outcomes, and what risks to implementation may come from the activities of particular stakeholder groups. This assessment is done via a stakeholder analysis.

From a social perspective, local stakeholders are particularly important: they should be involved in planning, and also in implementation of IWRM. They may be represented by irrigation water user associations or

associations set up to meet the needs of urban residents and involved in specific activities or consulted more widely, there may also be representation on higher–level bodies such as river basin management organisations. For successful implementation of IWRM, it is essential that these organisations are strong and sustainable, ensuring that their representatives are involved in the design, implementation and monitoring of activities, and that their members participate in decisions affecting their daily lives.

3.3 Stakeholder analysis

The stakeholder analysis, aims to:

- Identify and define the characteristics of the various stakeholder groups.
- Assess the ways in which they might affect or be affected by a water resources plan, programme or project.
- Understand the relations between stakeholders -including an assessment of actual or potential conflicts of interest and expectations.
- Identify relations between stakeholders that can be developed to facilitate implementation.
- Assess the capacity of different stakeholders to participate in different phases of a plan, programme or project.
- Assess possible risks to implementation resulting from the activities of particular stakeholder groups or from conflicts between stakeholders.

Information required for a stakeholder analysis can be obtained in a number of ways. In addition to information coming directly from water bureaus, departments, and from water supply companies, information on relevant current and recent conditions in relation to water use in various sectors can be obtained from line agencies – forestry, agriculture, development and reform commissions, land resources, environmental protection bureaus. Since changes in water conditions often impact differentially on women and men (in households, cultivation and production), it is important to obtain information from organisations such as the Women's Federation (ACWF). Information on current rural water use can be obtained both from village officials and from water user association officials.

Such information is important not only for deciding which stakeholder groups are relevant and how they can be categorised, but it also important as essential background for organising initial consultations with stakeholder groups. In organising these consultations, potential stakeholder groups can be visited and given a short briefing document on the plan, programme or project, its implementation and its implications for each particular group.

The information derived from the above visits and consultations enables a stakeholder analysis to be devised, specifying the main groups, the possible impact of a plan, programme or project on them, and the potential risks to them of project implementation. In WRDMAP, for example, this information was tabulated to describe the impact of an Integrated Water Resources Management (IWRM) Plan on stakeholders (Box 4 and 5).

Box 4: Primary stakeholder analysis for IWRM plan in the Shiyang River Basin, Gansu		
Primary stakeholders	**Potential Institutional and/or social impact**	**Potential risks to/ from IWRM implementation**
Shiyang River Basin Management Bureau (SRBMB)	Provision of management skills, enhanced technical abilities. Acquisition of social analytical skills for river basin management planning. More comprehensive understanding of the Shiyang River Basin. Political benefits from successful implementation of mandate. Improved co-ordination with line agencies.	Difficulties due to lack of clarity in relations between the SRBMB and Water Affairs Bureaus (WRBs) at various levels. Difficulties in communicating with WRBs. Few meaningful channels currently exist. Fragmentation of management responsibilities with line agencies may restrict possibilities for planning. Lack of relevant expertise amongst SRBMB staff. Lack of communication channels and consultations with water users and line agencies. Lack of support for demand management policies.
Water Users in rural communities and in Water User Associations (WUAs)	More equitable and reliable access to water as a result of improved river basin management planning, management and development. Greater access to information on water demand and allocation. Involvement in consultations on changes in water allocations, and on river basin planning in general. Reductions in water conflict. Improvements in irrigation management and control...	Water availability may be reduced, particularly in the lower basin areas, where existing shortages and increasing groundwater abstractions are most severe Current suggested improvements in social allocations to relatively poorer upstream users may not be possible within the river basin management proposals. Water reductions may require compensation. New skills and techniques required to manage changing water allocations.
Industrial water users	More equitable and reliable access to water in future river basin planning, management and development. Improved access to information on water allocation and demand. Greater involvement in consultations on water demand and allocations. Increased possibilities for re-cycling and leakage detection and control.	Reductions in privileged access to water availability and use. Increases in the prices of water. Investment required in recycling equipment.
Domestic Water Users	Increase in reliability of supply for upstream and downstream users. Increased availability of information on water supply. Enabling environment created for consultation on decision making concerning water use and allocation	Overall water availability may be reduced for downstream users. Increases in water prices.

Box 4: Primary stakeholder analysis for IWRM plan in the Shiyang River Basin, Gansu		
Water users on State Farms	More equitable and reliable access to water via involvement in decisions on basin planning and management.	Increases in the prices of water. Reductions in privileged access to water availability and use. Need to make investments in water-saving farming

Box 5: Secondary stakeholder analysis for IWRM plan in the Shiyang River Basin, Gansu		
Secondary Stakeholders	Potential institutional and/or social impact	Potential risks to/from Plan implementation
Jinchang Water Resources Bureau (WRB) and Wuwei Water Affairs Bureau (WAB) and their county and district subsidiaries	Acquisition of IWRM tools and improved knowledge base. Improved opportunities to participate in decision-making, enabling the water users in their areas to have a means to express their requirements. More reliable water resource assessments.	Lack of support for demand-led approaches.
Wuwei and Jinchang Municipal Governments	Increased information provided on Shiyang River Basin (SRB). Possibilities for more sustained and equitable water-sharing amongst their constituents via government's involvement in decisions on river basin planning and management	
Gansu Water Resources Department (WRD)	Possibility for increased understanding of SRB. Enhanced understanding of demand management policies. Improved information base for decision-making.	Variable interest in demand led approaches may influence level of support for project.
Gansu Hydrology Bureau	Increased knowledge of IWRM. Increase in use of databases, and in levels of expertise in using these. Improved information for decision-making	
Gansu Provincial Government and Peoples' Congress	Potential for greater involvement in decision making on water use and allocation. Provided with more adequate information on SRB. Possibility of increased participation by political representatives in decision-making on water use and allocation.	Lack of support for increases in water prices
Environmental Protection Agency –at provincial and municipal levels	Enhanced integrated natural resources management. Increased data sharing.	Benefits may not be fully realized due to limited co-operation and communication with WRB and WAD

Box 5: Secondary stakeholder analysis for IWRM plan in the Shiyang River Basin, Gansu		
Government line agencies in Jinchang and Wuwei Municipalities	Possibilities for increased involvement in decisions on water use and allocation. Benefiting from data sharing.	Poor communications between agencies may limit these benefits from being realized.
Government Non-Sector Agencies in Wuwei and Jinchang Municipalities	Enhanced possibilities for raising the needs and requirements of particular water user groups. Increased opportunities to protect the rights of these groups through greater involvement in decision-making.	Concerns over water price increases may affect support for, and involvement in decision-making.
Private Water Supply Companies	Greater information available for management and planning.	

Once a stakeholder analysis has been devised and tabulated in this way, it then provides a basis for:

- Ongoing consultations with stakeholder groups during the implementation of a WRM plan, programme or project;
- Organising the participation of groups at different stages of the plan, programme or project cycle;
- Disseminating appropriate information to stakeholders
- Facilitating communication between different stakeholders;
- Organising and overseeing the monitoring of plan, programme or project implementation.

3.4 Stakeholder involvement

Most importantly a stakeholder analysis can be used to help decide, when, how, and if particular stakeholders should be involved at each stage of design and implementation: which groups are going to be consulted, and when; which groups are going to be encouraged to participate, and when. At one stage it may be beneficial for some groups to be provided with information, but not consulted. At another stage, these groups may be consulted on impact and progress. At yet another stage, these groups may be encouraged to participate in decisions to be made on implementation.

A matrix can be devised for this, in relation to a particular stakeholder, groups of stakeholders, or primary and secondary stakeholders, as considered most appropriate for implementation. For example, in WRDMAP, in the case of IWRM Plan implementation in the Shiyang River Basin (above), taking an important primary stakeholder group, rural water users, from the stakeholder analysis it was estimated that their involvement would probably be as in Table 2, whereas a secondary stakeholder such as the private water companies, would be rather different (Table 3).

Table 2: Example of type of participation – rural water users

Types of Participation	Inform	Consult	Participate
Stages in project cycle:			
1. Identification		✓	
2. Planning		✓	
3. Implementation			✓
4. Monitoring and Evaluation		✓	

Table 3: Example of type of participation – private water supply company

Types of Participation	Inform	Consult	Participate
Stage in Cycle:			
1. Identification			✓
2. Planning		✓	
3. Implementation	✓		
4. Monitoring and Evaluation		✓	

A stakeholder analysis can assist in the important task of disseminating information about a plan, programme or project, its activities, and outcomes. Information can be specifically designed for different situations to suit the main interests of each stakeholder group, their concerns about aspects of implementation, and their relations with other stakeholders. It will also help decide the best channels for disseminating information to them by answering questions such as:

- Which media channels might be most appropriate?
- Should information be disseminated through non-governmental organisations?
- Should information be disseminated through particular line bureaus or commissions?

Information obtained from initial social assessments and consultations is extremely useful for addressing these questions.

3.5 Stakeholder participation: summary

A stakeholder analysis is a tool that assists in identifying and engaging with the main stakeholders involved in, or affected by the design and implementation of an IWRM plan, programme or project.

A stakeholder analysis helps:

- Identify and define the characteristics of the main stakeholders;
- Assess the ways in which stakeholders might affect or be affected by plan/ programme or project outcomes;
- Understand the relations between stakeholders, including an assessment of the real or potential conflicts of interest and expectations between stakeholders;
- Assess the capacity of different stakeholders to participate.

In any activity, it is important to decide which groups are going to be

consulted, and when; which groups are going to be encouraged to participate, and when. Developing matrices based on a stakeholder analysis can assist in making such decisions about stakeholder consultation and participation.

A stakeholder analysis can also provide important information to guide the task of disseminating information about a plan, programme or project, its activities, and outcomes.

4 Promoting Participation at a Local Level

4.1 Objectives of IWRM at a local level in irrigation sector

When water resources are stressed, difficult choices need to be made, and this may require reallocation of water away from irrigation. This is inevitably very contentious, and it will be important first to improve the quality and efficiency of local management so that the implications of reallocation are mitigated. An IWRM approach should ensure that these choices are made in the best possible way, but inevitably they may result in social changes that can cause problems for people's living conditions. For example, IWRM requires:

- Reviewing current water usage.
- Assessing relative water distribution between users.
- Reducing water consumption.
- Re-allocating supply reductions to other users, in relation to the needs of future development and sustainability.

This can lead to significant changes, such as:

- Increases in water prices.
- Reductions in irrigation supplies.
- Reduction in irrigation coverage.
- Some crops no longer being viable.

From a social viewpoint, it is crucial that these problems be addressed, and proposals developed for dealing with them, to mitigate their potentially adverse affects on people's livelihoods. The method and speed with which the changes are introduced can have important impacts on the ability to cope with them. Water User Associations (WUAs) can help in resolving these problems.

Promoting community participation at the local level

4.2 Involving communities via water user associations (WUAs)

Background to WUAs in China

WUAs enable increased participation in the management of irrigation by farmers. Giving greater responsibility to the users of water has been shown internationally and in China to improve management, to make water use more responsive to needs, and to reduce water costs.

A series of documents on WUAs, focusing on their role in water saving and water demand management has been prepared as part of this series (See bibliography: series 6.1 – WUAs and water saving society; and see 6.2 – Strengthening WUAs)

It can also result in reduced water consumption, by ensuring that the right amount of water is delivered at the right place and time. Participation has been found to be particularly valuable in the management of canals and infrastructure, in abstraction and the monitoring of flows, and in increasing awareness of the need for water saving. The importance of participation in water management is reflected in the *"Resolution on the Major Issues Regarding the Building of a Harmonious Society" (adopted at the Sixth Plenary Session of the 16th Central Committee of the CPC on Oct. 11, 2006)*– see Box 6.

Although the benefits are potentially substantial, a note of caution is appropriate. Much has been studied and written about irrigation WUAs, but these have been far more difficult to set up and sustain than was originally envisaged. The fact that traditional management is effective in many places does not make it easy to transfer modern management responsibilities to new user groups. The time and financial commitments needed for community management are widely recognised; but there may be other more subtle constraints related to internal disagreements, power struggles, or governance of the association. The difficulties need to be acknowledged and addressed specifically: the benefits should then outweigh the costs.

Box 6: Participation and the building of a harmonious society

The 16th Central Committee of the CPC set out provisions for promotion of a harmonious society (2006). These included measures

- To enhance institutional development and to safeguard social equity, justice and democratic rights, specifically the rights of being informed of affairs directly affecting their interests and livelihoods, participation, giving voice and superintendence.
- To establish effective mechanisms for the coordination of different interests, expression of appeals and requests, mediation of conflicts and safe-guarding of rights and interests, in order to adapt to the development and changes in the social structure and interests.
- To encourage community civil organizations, specialized cooperatives, etc to play active roles in community development, in order to realize effective links between government administration and autonomous community management, and between the government administration and citizens' autonomy (both according to the laws).
- To promote and strengthen social organizations to serve society, including social service delivery, and relaying opinions and petitions of the citizens to expand the channels through which people can express their opinions easily.
- To develop specialized farmers' cooperative organizations and strengthen the service function of the rural collective economic organizations.

Other relevant documents are NDRC / MWR (2005)[1] and MF / MWR (2006)[2].

[1] Document No. 2247 "Management Methods for Pilot Project of the Agricultural Water Supply's End Irrigation Systems' Rehabilitation

These policies have important implications for WUA development: *"WUAs are key platforms for farmers to exert various rights, and could play important roles in the coordination of different interests, expression of appeals and requests, intermediation of conflicts and safeguarding of rights and interests as well as the promotion of social harmony*.

The organizational structure and consultation procedures should pay special attention to ensure the rights of the poor and women".

In establishing WUAs, Chinese experience indicates that this is best guided by five principles, namely that a WUA is:

- A genuine farmer organisation, with officials democratically elected by members, and registered as a legal entity in its own right;
- Based on hydrological boundaries;
- Responsible for paying for water volumetrically;
- Responsible for collecting water fees from farmers and paying these directly to an irrigation company, based on a contract between the WUA and the company;
- Additionally, there must be a fully functioning irrigation system supplying water to the WUA.

Recent experiences with WUAs

In the recently implemented Pro-Poor Rural Water Reform Project in China, water user associations were established to manage, operate and maintain small-scale irrigation schemes in accordance with the principles outlined above. These are reported to have resulted in water saving and an improved management of resources. Elsewhere it is not always possible to comply with these principles, but this generally results in less satisfactory results or less sustainable WUAs

From a participatory perspective, two issues are important in relation to WUAs:

- How can farmer's management be promoted?
- How can the interests of household members best be represented in WUA decision-making?

It is difficult to good representation and effective participation in management. Some recent experiences in Minqin, Gansu are described in Box 7. A number of lessons can be drawn from this, leading to recommendations for strengthening WUAs.

[2] Document No. 124 "Management Methods for the Special Fund for Small-scale Farmland Irrigation Scheme Construction with the Central Fiscal Fund"

Box 7 WUAs in Minqin, Gansu Province

As is the case in many water user associations in China, consultation with WUA members was variable in the WRDMAP project villages. In some, there was a good awareness of the aims of the WUA, in others little understanding – combined with a view that WUAs were being set up as vehicles for implementing unpopular policies such as well closure. In none of the WUA villages was there much knowledge of the constitution, or of WUA regulations. The Water Affairs Bureau (WAB) drafted the constitution, with subsequent meetings involving only WUA executive members and – in some cases- water user group (WUG) leaders.

On the other hand, many villagers spoke favourably of the WUA as a source of advice and support – particularly in resolving conflicts, giving advice on irrigation types, irrigation schedules, maintaining canals, and tracking water supplies to households. In relation to such issues, WUAs often held meetings. In one village in Minqin County, for example, seventy meetings were held to discuss such issues in 2006. Although households have no say in the amounts of water received by the WUA, or in devising the general criteria for household water allocation, nonetheless they play a considerable part in discussions on the application of these criteria to households within their water user group. In household interviews, discussion groups and focus group sessions, participants spoke of the long and detailed discussions held within their respective WUGs on the ways in which the criteria should be applied to each household, to the benefit of the overall user group.

In addition to consultations, a further criterion for assessing participation is the degree of representation. At the lower levels of the WUAs in Minqin, this seemed quite strong, with each of the households in a branch canal/production team electing a leader for the canal. On average, 2-3 water group leaders were elected for each of the (usually 10-12) branch canals. These leaders negotiated with, and attended meetings called by the executive. At the executive level, however, representation was weak, with the executive committee members (usually six) nominated by the village and party committees, and the WUG leaders then approving them. The director of the WUA is the village leader and the vice director is nominated by the director.

WUAs: Approaches for improving participation and representation

On the basis of this experience in Gansu, there are a number of areas where improvements could be made to the process of representation in WUAs, both provincially and in China

To address member's lack of awareness and understanding of the WUA, its regulations and functions, it would be useful for each WUA executive, in consultation with the WUG to appoint at least two community representatives, whose task would be to increase awareness of the WUA, its constitution, regulations and activities. These facilitators can be WUA members, who will then receive appropriate training on increasing levels of awareness. In addition to their main task, they could also facilitate information exchange between farmers, ensuring that relevant knowledge of recent policies and their impact is disseminated within the WUA.

Additionally**,** within the group of WUG leaders, some could be given roles, responsibilities and tasks focusing specifically on water management and water saving at the WUG and household levels. This would require capacity building.

Most importantly, however, it is crucial for confidence building, for commitment of members to the WUA, and for its sustainability that representation be extended at the executive level. Beginning with one member, and progressing over a five-year period to 50% of its membership being elected by the water user group leaders, would be an important step forward in achieving these aims.

WUAs: Household participation and the role of women

In most Chinese provinces in recent years there has been a significant migration of labour, and particularly of male labour. From 2000-2007, for example, in Gansu Province, whilst overall per capita incomes for rural households almost tripled, the vast majority of this increase came from migrants, with income from local employment hardly showing any increase. In Minqin County, for example, approximately 80% of the male population migrates, compared with 20% of the female population (the latter usually migrating with their families).

This male migration has important consequences for the management of water resources:

- Women have to devote more of their time to agricultural tasks, in all areas, from planting to harvesting. Consequently, they are involved to a much greater extent in organising water locally, most importantly for irrigation below the production group level. More of the outlets from the channels to the fields in Gansu villages are managed by women, who are also undertaking most of the field irrigation. In Minqin, for example, on average 70-80% of the field irrigation is undertaken by women, although the larger canals are still managed mainly by men.
- In income terms, however, women remain in a secondary position in the household, since the money they are bringing into the household is less than the money earned by their husbands from migrant labour.
- Hence, despite their increasing workload and responsibilities in organising cultivation locally, women's status generally remains lower than their husbands, both within the family and the overall village community.
- This maintenance of male status, based on received family income, enables the perpetuation of a paradoxical situation, whereby, despite their predominant role in the organisation of cultivation and irrigation locally (i.e. below the production group level), women still have very little involvement in decisions concerning the overall use of water in their areas, since these decisions are made at the village level (either through the village committee or through the water user association), and above, where the composition is overwhelmingly male.
- Implementation of policies for water use at the local level is thus being undertaken without the involvement of many of those who are actually organising implementation. Clearly, this impact is variable. In Minqin County, for example, in its relatively poorer, more distant areas, with lower levels of migration, women's involvement in irrigation is lower than in areas closer to the county town. However, it remains an important trend, and one which needs to be taken into account in developing and implementing plans based on IWRM.

This situation of increasing involvement of women in cultivation

and local irrigation, and their growing responsibilities in these areas, alongside their limited involvement in decisions affecting cultivation, is raised repeatedly by women in village interviews, discussions, focus groups, workshops, stakeholder consultations, and in training sessions. Women often contrast their active role in irrigated agriculture with their limited participation and representation in WUAs. Usually, there are very few women members on WUA executives. Male predominance is reinforced by a system of voting in which the household head casts the vote in the WUA. With the exception of a very small number of female-headed and elderly households, this excludes women from voting.

Similarly, major decisions on water use are taken by the production group/water user group leaders, who in the WUAs are overwhelmingly male. As one might expect, given this system, attendance at WUA meetings is largely male, reinforced by women having to carry out household tasks after completing their daily agricultural work. Women generally have little or no knowledge of their WUA and its operation, nor of policies being implemented by the WUA which would impact their daily lives. This is particularly disadvantageous to them, under current conditions.

Consequently, it is important to consider ways in which women's participation can be improved, in the interests of establishing a more meaningful basis for water resources management project implementation. The following can be suggested, on the basis of some recent experiences with WUAs in Gansu:

- To facilitate the expression of women's interests, and to meet the need to enhance their level of representation within WUAs, it is recommended that WUA constitutions are amended, requiring that at least 25% of the household representatives are women, and that this figure is replicated within Water User Group leaders.
- It is also recommended that at least four of the Water User Executive Members are directly elected by Water User Group Leaders, and that there should be at least one woman elected to the Executive.
- Extending representation in this way will require substantial capacity building amongst women within WUAs. For this capacity building, there should be a focus on areas such as the following: enhancing knowledge of central and local government policies in relation to farmers rights and land use rights; participation in water use and management; policies for water saving; cost-benefit analyses for cropping investment; water management –based on experiences of managing surface and groundwater and its conjunctive use elsewhere in China; enhancing communications skills; training in conflict management.
- In addition to the specific recommendations made for each of these areas, above, it would also be beneficial if each WUA executive, in consultation with WUG leaders, appointed at least two community representatives, whose task will be to increase awareness of the importance and potential impact of water resources management policies on farmer's livelihoods,

and particularly amongst women. These facilitators can be WUA members, who will then receive appropriate training on increasing levels of awareness. In addition to their main task – of facilitating information exchange between women, and ensuring that relevant knowledge of recent policies and their impact is disseminated within the WUA - their work should also include developing an awareness within households of the WUA constitution, regulations, representation, aims, organisation and activities.

- Developing operating procedures that recognise the different approaches to participation favoured by women, ensuring that public meetings are held in ways that encourage their involvement, and that changes to irrigation operation at field level allow for women's other activities (eg: allowing for women's involvement in household work and children's education, just as allowance is made for male needs for migration and off-farm employment).

These suggestions are aimed at increasing women's participation in WUAs. However, it is stressed that these suggestions assume that an effective representative WUA already exists, albeit dominated by men. In some cases the WUAs are weak and ineffective and only exist as paper organisations. Whilst this may be partly due to lack of female involvement, in most cases the reasons for weak WUAs are more fundamental, and these issues need to be addressed simultaneously (as described in AN 6.1/1 and 6.2/4). Increasing female representation in an ineffective organisation is likely to increase their frustration and sense of exclusion even further.

4.3 Capacity building for participation

Enhancing participation in decision-making, improving representation, and promoting greater equity all require commitment by water users to the WUA and its operation. This may be difficult in situations where the WUA is responsible for introducing what are often perceived as unpopular changes required for water-saving – as is the case in many areas of China. It is crucial for success that farmers are convinced that in the long term the WUA will benefit the community. For this to occur, it is essential that capacity building be undertaken for government staff at county and township level to ensure that they understand the role of WUAs, and provide the necessary support, particularly the enabling institutional environment. Capacity building is also necessary for WUA and WUG leaders, developing relevant technical, organisational and financial skills.

Training for WUA leaders and farmers should focus on developing and strengthening relationships between village/tertiary canal WUAs, higher level (secondary canal) WUAs, WUA federations (where they exist), the water management divisions and stations (WMD and WMS) and WABs.

Capacity building (see AN6.2/4 for further details) could comprise some or all of the following:

- *Study tours*, to established, successful WUAs within China – these should be carefully chosen to be comparable to the

area where WUAs are to be set up;

- *Training of Trainers* –for county level specialists who then carry out training directly with WUA members;
- *Awareness Programmes* – publicising the objectives and potential benefits of establishing WUAs. Such programmes could be implemented initially in pilot WUAs, and in other villages irrigated by the same canals, being extended gradually to the entire irrigation district. Dissemination of information can be via mass meetings, at village markets, via poster campaigns and the delivery of brochures, at village film shows and via local television.
- *Assisting the formation and registration of WUAs*, if this has not been done previously – preparing the WUA constitutions and regulations;
- *Providing relevant technical and administrative programmes* – training for WUA executive members, for developing effective working relations with WMS staff, and for achieving water saving. Programmes could be provided in particular areas, such as: conjunctive management of surface and groundwater levels, IC Card use, market assessment and cost-benefit analysis, financial management, conflict resolution, and participatory monitoring and evaluation.
- *Improving Access to Information* – it is often the case that information about the management, financing, and general operation of WUAs is available only to a limited group – of officials and experts. For the sustainability of the WUA, it is crucial that such information is shared with farmers. This can be achieved via the awareness programmes. Water users also need support for developing effective mutual working arrangements with the local Water Management Department (WMD) and WMS. Improved working arrangements can be facilitated by joint training programmes.

Appropriate financial arrangements are essential for the sustainable future of a WUA. If, for example, the WUA collects fees for the local government, then it should be entitled to keep a proportion of the fees for administrative and staff costs. Similarly, if it is involved in monitoring permits, it should be entitled to a proportion of the water resource fees.

Aside from these specific issues, it is essential that fees are minimised (so that farmers can afford them), but that all costs are covered. Training for understanding financial issues needs to be provided for WUA and WUG leaders, and information on financing made available to all farming households.

4.4 Water user associations and water saving

The introduction of IWRM in water-short areas generally requires implementation of measures to reduce water allocations to households. This can result in social changes that can cause problems for people's living conditions. Water supplies may need to be reduced or re-allocated, and this may lead to increases in prices, to reductions in irrigation coverage, or

cultivation of some crops no longer being viable.

From a social viewpoint, it is crucial that these problems are addressed, and proposals developed for dealing with them, to offset their potentially adverse affects on people's livelihoods via mitigation. This is often the case with the introduction of water-saving measures. Water saving generally results in an increase in labour requirements, which is a direct cost to many households (either because of the need to employ farm workers, or because of the income foregone from off-farm work which cannot be done).

International experience with water saving management tools shows that whilst the introduction of WUAs can result in water savings, it is almost never the reason given by farmers for establishing them. Farmers want WUAs to reduce their costs and improve their access to water. In China WUAs are set up in ways which should achieve these goals in the long term, but in the short term WUAs can both increase their costs and reduce their access to water. There needs to be a very sensitive approach to setting up WUAs in this situation and very carefully designed measures to give farmers an incentive to participate in the short term. Often this is done by providing assistance with infrastructure improvements and maintenance, but elsewhere additional training and support on irrigation management and water-saving agricultural techniques may be more appropriate. Fees should be structured in a way which encourages participation without increasing costs.

Box 8: Water saving in Gansu

Many policies to achieve water saving have been introduced by the Central and Provincial Governments in Gansu Province. These aimed to address water resource problems by substantially reducing ground water use, converting agricultural land to forestry and grazing land, and reducing farmland.

The policies involved extensive well closures, land reduction, greenhouse development, the introduction of IC Cards and household water use certificates, a planned re-issuing of abstraction permits and an increase in the amount of surface water through upstream transfers and water allocations.

Well closures and accompanying land reduction policies have had a significant impact, with farmers concerned at reductions in their incomes. WUAs had no involvement in decisions about well closure in their areas. These decisions were made by village committee members in discussion with sub-village heads. The solution proposed by the provincial government to mitigate the impact of well closure and land reduction was to encourage (and subsidise) greenhouse construction, with one *mu* greenhouse replacing two *mu* of arable land. The problem with this solution was that it was an option relatively easy to implement for wealthier households, less so for average households, and difficult for low income and poor households. Whilst farmers received subsidies and compensation, it was necessary for most to take out loans, something that was extremely difficult for low income and poor households.

In response to these policies, and particularly when they could not construct greenhouses, farmers adopted a series of coping strategies - trying to extend animal husbandry and to change cropping patterns. To meet income shortfalls, villages used income from collective farms to assist farmers in moving into water saving crops and changing irrigation methods.

There have been many programmes for encouraging water saving in China (see Box 8 above for example describing the situation in the Shiyang River Basin, Gansu). Much can be learned by analysing the problems encountered and how these problems were addressed - particularly to understand how farmers tried to cope with the impact of changes, since their reactions can help us in devising mitigation in future projects.

It is apparent that in many cases, farmers will face significant difficulties as a result of these policies – particularly well closure and land reduction. It is important both to consider appropriate mitigation policies, and to recognise the creative strategies already adopted by farmers, assisting them where possible.

Since farmers may be heavily impacted by well closures, WUA members should be involved in these discussions.

For example, since the impact of well closure can have a major impact on farming livelihoods, it would be beneficial if WUA members were involved in discussions on well closure. Once targets have been received, WUA executives – in discussion with village committee members- can initiate discussions with water user group leaders, who can have consultations with household representatives before decisions are reached on the closure of particular wells.

Similarly, with regard to greenhouse construction, farmer's reluctance to become involved could be met by the provision of appropriate training in the skills required for greenhouse cultivation, and an adequate provision of market information from cropping associations. This could be directed through WUAs.

Given the variety of household coping strategies adopted, it would be worthwhile for WUAs to produce short documents, summarising the main advantages/ disadvantages of adopting particular strategies. Additionally, information could be disseminated via short pamphlets produced by the Water Affairs and other Bureaus.

Mitigation for low-income and poor households is much more difficult. Poor households struggle to pay water fees, and for them, at the moment, greenhouse construction is not a viable option. Since most are already in debt, loans are not possible – unless they use relative's loan standing to obtain loans, or borrow directly from better-off relatives. There are no formal institutional water sector specific provisions for assisting such poor households, only the *five-guarantees*[3] subsidies from the Civil Affairs Bureau, together with rural *di bao* payments. These subsidies and payments enable families to survive, but for many getting out of poverty remains difficult. In the case of widowed families without children, the village committee organises villagers to assist during planting, harvesting and irrigation. In

[3] The Five Guarantees Subsidy provides a minimal subsidy to the poorest households, covering minimal subsidisation of food, clothing, education, housing and funeral expenses.

the unlikely event that poor households can afford to construct greenhouses, the County Government pays the interest on their loan. Perhaps most importantly, at the WUA leader and executive level, if poor households cannot pay their fees on time, leaders sometimes intercede on their behalf to request deferment of payment for two months, with the support of the village committee, if necessary. Poor household members consider that this has proven invaluable to them in the years when they have been particularly stretched financially, and it could be made more generally available as an option.

These suggestions for mitigation, derived from WRDMAP implementation, were received favourably by WUA members in stakeholder workshop discussions, as appropriate and viable responses to the introduction of land reduction, well closures and associated policies. Consequently, It is worthwhile considering ways in which they can be implemented along with water saving policies, not only in the WRMAP pilot villages, but elsewhere when similar policies are introduced.

4.5 Water user associations and conflict resolution

In addition to ways in which they can be involved in mitigation, WUAs can also have an important role in addressing conflicts over water allocation and use. Experiences of water resources management in the rural sectors of many countries indicate that water associations can facilitate the resolution of conflicts over water use.

Conflicts over water at village level can take many forms – there may be direct, overt conflict between neighbours over the timing of opening or closing an outlet, but often conflict is concealed and takes the form of simmering discontent which the weaker party feels that they have to live with. A good WUA may make people more willing to discuss such hidden conflicts, and hence resolve them. However, this can create a perverse situation where a good WUA may apparently increase the number of conflicts – but it should then enable them to be resolved, and result in a more widely harmonious society.

Conflicts over water can arise from a number of sources:

- Those at the end of the irrigation system may be under-serviced, particularly during periods of water shortage.
- There may be a lack of transparency, with farmers being unsure how much water their neighbours have taken (they can observe times or depths of irrigation, but volumes of water are hard to estimate at farm level).
- There may be a lack of clarity in determining who is actually responsible for the distribution of water, the terms and conditions of the distribution, and whether the distribution occurs as contracted.
- Irregularity and infrequency in the supply of water may result in farming households wasting time “guarding” their water channels to ensure that they obtain sufficient water when it finally arrives on their plots (particularly at night). This particularly affects women household members

- Farmers may try to close off irrigation canals, reducing supplies to those further downstream.
- Households may use more water than permitted by the irrigation schedule.
- A farmer may maintain his/her irrigation and drainage system ineffectively, there by reducing the amount and quality of water available to others.

Water User Associations aim to address and deal with such conflicts, via an agreed management and allocation of water to WUA members. This aim is stressed in Chinese Government policy documents, particularly those referring to management methods, where the aim of achieving successful conflict resolution is highlighted For example, NDRC / MWR (2005)[4] and MF / MWR (2006)[5] state that WUAs should play a key role in the intermediation of conflicts, as well as the coordination of different interests, expression of appeals and requests, the safeguarding of rights and interests and more generally in the promotion of social harmony.

Internationally, WUAs have a variety of ways of dealing with conflicts, whether to prevent them from occurring, or to resolve them once they have arisen. For example:

- Participatory assessments with WUA households can be undertaken to ascertain potential areas for conflict, as has been done in South Africa, particularly since the passage of the National Water Act in 1998, initiating IWRM policies.
- Particular mechanisms can be set up within the WUA to deal with conflicts. In Kenya, for example, WUA constitutions state that the WUA will "*provide a forum for all WUA members to discuss, prevent and resolve water use conflicts*". In some countries, conflict-resolution committees have been established. In the Kyrgyz Republic, for example, some WUAs have established *"conflict resolution commissions*" specifically for this purpose. In other places, particular executive members can take responsibility for conflict handling and resolution.
- The capacity of WUG leaders can also be developed so that they acquire the skills and expertise responsibly handle conflict management, arbitration, and reporting
- Systems can also be established where appeals are made to bodies external to the WUA, as can be the case in China, with arbitration being undertaken by village committee members.

The ability of good WUAs to reduce conflict over water is an important motive for establishing WUAs in most countries. Such conflict reduction has important wider social benefits. Resolving conflict over water is generally acknowledged to be an effective way of promoting cooperation in many other aspects of village life. Conversely, failure to resolve conflicts

[4] Document No. 2247 *"Management Methods for Pilot Project of the Agricultural Water Supply's End Irrigation Systems' Rehabilitation*

[5] Document No. 124 "*Management Methods for the Special Fund for Small-scale Farmland Irrigation Scheme Construction with the Central Fiscal Fund*"

over water can have much wider social repercussions.

5 Promoting Participation and Social Development at River Basin Level

5.1 Introduction

As mentioned at the outset, participation is relatively simple and well-studied at the local level – although there are still many difficulties even at that level (as described in Section 4). This section considers the problems involved in tackling social problems at the river basin level. This needs to take account of the relative priorities of the various sectors

Irrigation is the main use of water in China (accounting for about 70% of water abstractions) and is the focus of this document. However, other industrial uses are increasing in importance and there is a growing awareness of the need to allocate water for environmental uses.

This section thus relates large scale irrigation uses with river basin management as a whole. There are many other social aspects of IWRM – for example the impacts of water quality management or flood management on livelihoods, which are outside the scope of this document. Useful guidelines are already available for some of these other issues (see for example, the case of flood management http://www.apfm.info/pdf/ifm_social_aspects.pdf).

5.2 Management arrangements at river basin level

The institutional arrangements set up for river basin management can have important implications for the way social considerations and participation are accommodated – depending on how the various stakeholders fit into these institutional arrangements. It is thus first necessary to consider the basic options.

These arrangements fall into four categories as illustrated on Figure 1, which distinguishes between state-driven and stakeholder driven functions, and between centralized and decentralized modes. In this figure the various circles and squares refer to the different stakeholders, and they are connected by lines which denote the primary links between stakeholders. All models have an organisation with primary responsibility for river basin management, but the nature of relationships with other stakeholders depending on whether it is a top-down hierarchical process or one with more links at different levels.

Stakeholder-driven arrangements have many direct links between other stakeholders (both users and organisations) and the water sector agency which is at the heart of river basin management. State-driven organisations are much more hierarchical and participation by other stakeholders is more indirect.

The traditional approach in China is the state-driven model, but this is gradually moving towards stakeholder driven modes. This is relatively easy in small river basins, but becomes increasingly difficult to achieve as the size of the basin increases. Coordination is achieved through multiple committees and working groups linking stakeholders into discussion and decision-making forums.

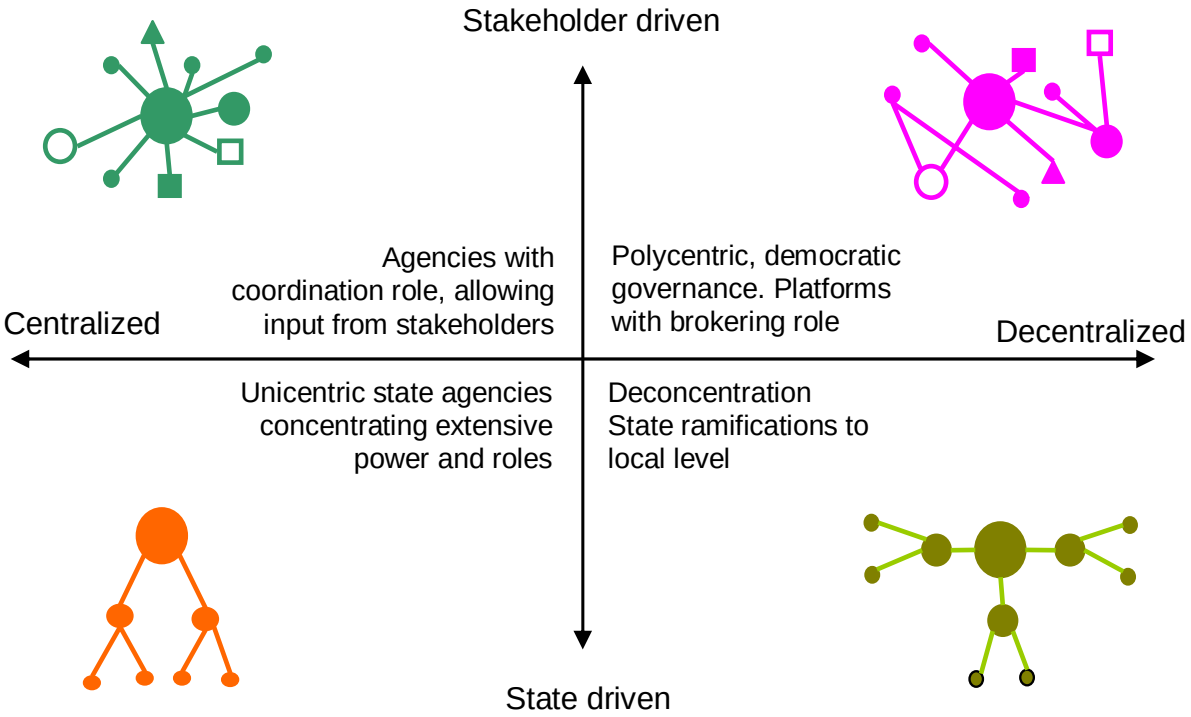
Stakeholder-driven arrangements require careful attention to the representation of marginal groups.

Unless these are well-designed they may privilege those who are better educated and thus they may formalise inequality rather than giving voice to marginal groups.

5.3 Co-operation between organisations to improve social impact

A clearly formulated organisational framework is essential for sound management of water resources. IWRM must take into account the plans and policies of the different water-related sectors so that conflicts can be minimised and where necessary activities co-ordinated. Whilst it should be self-evident that such cooperation is essential for IWRM, it is particularly important for ensuring that the social benefits of IWRM are realised. Individual water users do not relate just to the WABs but to all other organisations involved with water – including agriculture, forestry, environmental protection as well as finance departments and so on. In addition to coordinating with each other, these organisations also need to relate effectively to water users, and ensuring that their needs are understood and met as much as possible.

Figure 1: Models of river basin governance



After Molle 2007

For example, Environmental Protection Bureaus (EPBs) are concerned with relevant areas such as water quality protection, pollution monitoring, and water ecology; Forestry Bureaus have water concerns via their wetlands management and promotion of forestry in water source and irrigation areas; Water Bureaus have the most direct concerns in areas such as policies and regulations to protect and manage water quantity and quality, sharing water resources between users, promoting irrigation, operating reservoirs, and monitoring. All of these organisations need to recognise the

social issues, and for IWRM to be meaningful, the plans of such organisations must intersect with the overall river basin management plan. Extensive and institutionalised co-operation on a range of levels – from regular joint meetings on issues of implementation, to data sharing, dissemination and monitoring - is required for intersection to succeed and ensure that social objectives are met.

This can be seen from the case of the Shiyang River Basin (Box 9) where the co-operation between government organisations was reasonably successful, although the extent to which they coordinated directly with water users is less evident. More formalised cooperative arrangements between organisations, with closer participation by water users would reduce the risk of creating many social problems, and maximise the social impact of the plan. A series of issue-based multi-disciplinary working groups with representative participation by water users is needed to achieve this. It is suggested that working groups covering topics such as irrigation management, greenhouse development, urban water demand management, water pricing, etc should be established.

Box 9: Institutional cooperation to ensure social objectives in Shiyang River Basin

The main driver for cooperation to date is the Municipal Government, which require that the bureaus' individual plans conform to Shiyang River Basin (SRB) strategic plan aims. The planning process had the following stages. Firstly, sector plans were delivered to the Shiyang River Basin Management Bureau (SRBMB). Following this, the SRMB arranged a series of meetings with each of the main bureaus at the municipal, county and township levels which aimed to integrate the sector plans into the strategic plan, decide responsibilities for implementation and communicate these to municipality and county levels.

In this process, whilst there is little doubt that consensus was achieved between the SRBMB and the sector bureaus at the planning stage, this "buy-in" often did not go beyond this to a more institutionalised form of co-operation during the process of plan implementation.

Nevertheless, the regular contact set up between the bureaus in this way did enable them to discuss problems arising from the social impact of IWRM, and to discuss how particular bureaus could address such problems.

From a social perspective, it was apparent that this process could be improved to so that there would be greater consideration of how the social issues of each sector plan impacted on each other, and whether social benefits could be enhanced by integration (in a process of IWRM).

Consequently, in further discussions with the SRBMB and the bureaus, it was recommended that the main bureaus involved in the sector plans should participate with the SRBMB and water user representatives in '*working groups*' to improve planning and implementation of the strategic plan. These working groups would cover a range of topics. Working groups would cover many aspects of IWRM, but some groups would cover cross-sectoral issues, such as greenhouse development which have an important social impact.

5.4 Participation by water users in river basin planning

Introduction

There needs to be some direct representation by end-users in river basin level management:

Users need to be able to:

- Present their views to the river managers and have some influence in the decision-making process;
- Become aware of the changes required, and what the overall reductions in water availability in their sector will be; and
- Learn about potential methods for coping with this change (whether imposed reductions to quotas, or voluntary mechanisms).

Given the large number of users, this can only be done on a representative basis. There are many ways of achieving this – for example via local government, via existing organisations such as the Women's federation, and via new civil society organisations such as river-basin level federations of WUAs.

In many countries, including the UK, participation was traditionally indirect via existing democratically-elected bodies (local councils) rather than by direct involvement in water sector issues. This has changed recently, particularly after the water framework directive was enacted. For example, the National Farmers' Union represents the interests of agricultural water users, and responds on their behalf to consultations on river basin management plans.

Existing civil society organisations may be very effective, but their interests often cross many sectors and they may not have the technical knowledge or interest to contribute to water sector planning as effectively as is required.

Thus new high level federations of water users are widely promoted to ensure that user views are taken into account. This is the approach adopted in Nepal for example (Box 10).

Box 10. The National Federation of Irrigation Water Users' Association, Nepal

NFIWUAN was formed in 1998 to promote participatory irrigation development, water user empowerment, and partnership among the agencies involved in irrigation development. From an initial membership of 13 water users associations (WUAs) from 8 districts, NFIWUAN has grown into its current membership of 2,139 WUAs from 68 districts (essentially the whole country). The NFIWUAN comprises the leaders of the WUAs, and the committee is elected from these members.

The NFIWUAN has worked at two levels:

- To support WUAs
- To influence government policy to take account of local needs

The support to WUAs covered many topics including:

- Participation of women and unorganized water users in irrigation management was promoted
- Training and interaction programs
- developing tools and techniques for group formation and how to apply these tools;
- building awareness among the water users concerning water policy, program and local issues

Activities at a national level are even more important. NFIWUAN has been involved in formulation of national policy, through participation in working groups on irrigation policy design, irrigation charges, and resettlement issues. A coordination committee was also set up with representatives from other sectoral user groups (eg forestry) and civil society

Participation in water sector planning at river basin (or municipality) level in China requires effective participation by water users. The extreme water shortage in many parts of the country means that both issues and potential solutions are complex – much more so than in the case of Nepal as cited in Box 10. It is thus likely that direct representation of users is needed, rather than reliance on existing local government or multi-sectoral civil society organisations.

Key issues where water user participation is needed

The establishment of water savings societies in severely water-stressed areas such as the Shiyang river Basin requires extreme measures to reduce the area irrigated and hence the volume of water consumed by agriculture.

WUAs can participate, as described earlier in the implementation of some of these at local level. However, they should also contribute to higher level planning. Their views should be sought on:

- Overall approaches to local water savings:
  - Irrigated area reduction (surface irrigation and well closure)
  - Inter-basin transfers
- Implementation methods
  - Water rights
  - Abstraction permits
  - Water charges
- Enforcement measures
  - IC cards
  - Crop restrictions
  - Irrigation schedules
- Coping measures
  - Agricultural training
  - Subsidies for greenhouses
  - Agro-industrial development
- Monitoring systems
  - Water use
  - Groundwater level

Many of these topics have an important social impact. Reduction in the area irrigated has a proportionate impact on household income and thus has a very severe impact unless it can be offset by subsidised measures to make more productive use of the smaller area of land (greenhouses, higher value crops), or to promote off-farm activities. Local knowledge of these and other issues will be important for designing and implementable plan.

Ultimately, agricultural water users will not be able to get exactly what they want in a situation such as that in the SRB, as they are already short of water and yet water use is at an unsustainably high level. However, local participation can help design the most appropriate way to move towards a sustainable situation. This will require water users' involvement in working groups – together with water resource professionals, agricultural specialists and so on.

Mechanisms for participation

River basin planning is a complex technical task and requires specialist knowledge and generally the use of models. However, such models are only as good as the data that is used in them. River basin planning organisations are thus dominated by water resource professionals, but with

sufficiently representation that they have a sound basis for planning. A series of working groups or consultative groups are generally recommended for this. In some of these it will be sufficient for the users to have a single representative – the chairman of a basin level federation of WUAs for example. He or she will be able to participate effectively in discussions on the overall percentage of water to be allocated to agriculture, and hence the coping strategies needed in each area. When it comes to more detailed issues such as allocation between municipalities or counties, slightly greater representation may be needed – perhaps the chairmen of WUA federations for each county should be involved in the relevant working group.

5.5 Dissemination of information on water affairs

Water users and the public in general need to have access to relevant and detailed information on water management policies and programmes. This will ensure that they understand the reasons for the policies, are able to comply with them, and are willing to adopt water savings measures. This too depends on good co-ordination between organisations to ensure that they receive consistent, comprehensive information in a convenient form. In relation to this, civil society organisations are vitally important, being able to utilise their local level resources to promote the ideas of IWRM and water saving.

Local Water Saving Offices is particularly important for ensuring good dissemination information, and the Women's Federation (ACWF) has an important role in channelling information to women who are otherwise often at disadvantage in gaining information on government programmes. Boxes 11 and 12 indicates how these two organisations have helped in the dissemination of information about water resources management in the Shiyang River Basin in Gansu – particularly for the implementation of the Strategic Plan.

Box 11: Role of the Women's Federation (ACWF) in the Shiyang River Basin

The ACWF is a key agency, with considerable potential for disseminating the main aspects of the SRB strategic plan, and – more generally- ideas for water saving. It has branches at the county, township and village levels, and its leading members always have at least one post on the executive of the water user associations. Its importance in the process of dissemination lies both in its close relations with bureaus key for plan implementation, working with them on water and water-related issues and on its ability to communicate water saving ideas to its members. It also instigates its own water-saving projects, funded largely by charities.

Working with the SRBMB and the WAB, the Women's Federation has produced documents for use at the branch level on, for example, the reasons for greenhouse construction, how to train women to equip them for greenhouse cultivation, and the strategic basis for well closures. The Federation is also active in producing articles on water saving measures, notably in local newspapers. It is co-operating with the WAB on a series of water related projects for women, notably on the construction of water tanks in villages, and has also worked with the WAB on television programmes promoting water saving. Most recently, the main proposals of the SRBMP have been discussed within the Federation, at each administrative level.

The ACWF has the advantage that it is a well-established local organisation. Although it has multiple interests, this means it is able to bring a broad perspective to water issues (Box 11).

The Water Saving Office is different in that it has a single focus, but needs to coordinate with many different bodies (Box 12).

Box 12 Wuwei Municipality Water Saving Office (WSO)

The WSO has an important role in disseminating information on the Strategic plan. The Office provides advice on

- irrigation and water saving;
- well closure and farmland reconstruction;
- water allocation to user groups.
- Providing advice to farming households on water-saving technology;
- publishing pamphlets for households on water-saving appliances;
- producing educational packages on water saving for use in schools.

It also advises on water saving designs for the construction of industrial buildings and overseeing the upgrading of water-saving facilities in factories.

The office plays a crucial role in the city's public campaigns. Recently its educational work has expanded into schools in village communities, and it has advised several bureaus on plans to save water in their offices. In all it's planning, its mandate requires the office to ensure that its projects are in conformity with the aims of the SRBMP. The Office has an overall Water Savings Plan for Wuwei

The cases of the Women's Federation and the Water Saving Office illustrate the important dissemination work that can be undertaken by agencies in the water-saving area, targeting stakeholders through the use of TV and newspaper articles, and via information posted on websites.

It is crucial that River Basin Management organisations establish operating networks and regular information exchange with such organisations, ideally having representatives on the inter-organisational committee to discuss and then oversee IWRM Plan outcomes.

6 Protecting Livelihoods Through IWRM

6.1 IWRM and poverty

Implementation of IWRM can bring benefits for individual and household livelihoods, for example through the promotion of a more equitable distribution of water between users, through reducing pollution levels, by protecting poorer households through enforcement of permit conditions for larger abstractors, and by creating frameworks for reducing conflicts over water supply and use (particularly as a result of the development of WUAs)

However, it is usually the case that such benefits emerge in the long-term, and in the short-term the concern is more with mitigation – dealing with the adverse impact of measures such as increases in water prices, reductions in irrigation supplies and crop coverage. Farming households need support in dealing with such impacts.

Attempts to implement water savings measures without adequate participation are very risky, and likely to result invite conflict. Difficult measures are much more likely to be accepted if people understand why they are being introduced and believe that they are fair. Even in the short term there can be benefits to the community from the increased awareness of the need for water saving.

However, measures will not in general result in immediate improvements in livelihoods as measured in terms of income or in areas of human development, or in a reduction in poverty levels, but it may evident in areas such as maintenance of social capital (essentially meaning, in this context, improved cooperative

arrangements and social harmony at a village level) possibly resulting in a fairer application of the policies and restrictions on water use.

In the longer-run, more direct improvements in livelihoods will be evidenced, as water is managed more efficiently, equitably and productively.

6.2 Gender relations in IWRM

Unequal power relations in the community often place women in a disadvantaged position in relation to water resources, and it is essential that plans for management and participation address this weakness.

This is reinforced by the fact that involvement of women in the management of rural water supply has been shown in many cases – both in China and internationally - to have increased both the effectiveness and efficiency of this management. Reviews undertaken by a number of institutions (notably by the World Bank[6]) have noted that where women's knowledge has been included in planning and practice, this has contributed to successful project outcomes.

Similar observations have been made on the importance of women's participation of WUAs for irrigation management. This is reinforced by the increasing involvement of women in cultivation and local irrigation, and their growing responsibilities in these areas requires increased representation for women at both the WUA executive and water user group levels.

Women's participation in these local organisations should be reflected at higher levels in the water resources management hierarchy (within water management stations and water affairs bureaus) to ensure that the local needs are incorporated into overall plans and implementation arrangements.

Box 13 indicates some important approaches for promoting women's' issues in IWRM.

Enhancing women's involvement and extending representation for women in these ways will require considerable capacity building. At a local level, experience gained in the WRDMAP project in Gansu indicated that this training should include, for example:

- knowledge of central and local government policies in relation to farmers rights and land use rights;
- Participation in water use and management;
- Policies for water saving;
- Cost-benefit analyses for cropping investment;
- Water management – including managing surface and groundwater and its conjunctive use elsewhere in China;
- Communications skills;
- Conflict management.

Unequal power relations in the community often place women in a disadvantaged position in relation to water resources

[6] See D.Narayan, "The Contribution of People's Participation: Evidence from 121 Rural Water Supply Projects", World Bank, Washington, 1995.

Box 13: Promoting women's issues in IWRM
1. Mainstreaming
• In IWRM implementation, water sector staff and leading members of stakeholder groups should be aware of the importance of gender issues in water resources management. • They should be sensitive to gender issues throughout the project cycle in design, implementation and monitoring. • They should analyse and be aware of the differential impacts of activities on men and women.
2. Promoting women's participation in decision-making in Community and Water User Organisations
Women's participation can be enhanced in many ways. For example, by: • Water User Associations ensuring that women are represented at both the production group and executive levels, with a minimum of 25% representation. • Water User Committees promoting women to deputy and deputy director positions • Developing ways of women expressing their needs, interests and views on water use and management decisions affecting their daily lives • Consulting the Women's Federation on the roles played by women in water use and management.
3. Carrying out training on IWRM and Gender
• Staff in water sector organisations, and leading members of stakeholder groups need to understand the roles and needs of women in water use and management • Awareness of the women's needs should be promoted in activities throughout IWRM implementation • The Women's Federation should be involved as a key stakeholder in decision-making and training
4. Ensuring that information on water use and management is provided to both men and women
• Effective channels should be developed for providing women with the fullest possible information • Women's views and opinions should be sought on this information provision • Meetings should be held at times and in locations that are suitable to both men and women, and women's attendance at meetings should be actively encouraged • Water sector staff responsible for IWRM implementation should ensure that women have been consulted on the design, implementation and monitoring of IWRM activities.

Capacity- and awareness-building is also needed in government organisations to ensure that these organisations understand the need for and encourage women's participation at a local level. These organisations are currently predominantly staffed by men, particularly at the higher decision-making levels.

7 Conclusion: the Social Impact of IWRM

Integrated Water Resources Management (IWRM) aims to promote the "*co-ordinated management and development of water, land and related resources*".

One of the three main strategic objectives of IWRM is to ensure equity in access to water between different social and economic groups. It is often

the most vulnerable and poorest sections of the community who are the most dependent for their livelihoods on direct access to water (for irrigation of basic food crops), who are most likely to suffer from unfair access to water.

As resources become over-exploited, difficult choices need to be made between alternative uses of increasingly scarce water, and in reconciling these social issues with economic and environmental priorities.

In the short term it is often difficult to protect livelihoods, but this document outlines some of the key issues and suggests some approaches that can be adopted. These will help people to cope with the difficult transition and ultimately help improve livelihoods by:

- Promoting a more equitable distribution of water between users;
- Creating enabling frameworks for reducing conflicts over water allocations and use;
- Increasing the influence of water users in decision-making on the management and use of their water resources, particularly via their participation in water user associations;
- Involving stakeholder groups in decision-making, thereby enabling a more effective, sustainable and responsive implementation of the management of water resources, and reducing the risk of failure;
- Enabling enhanced participation by women, particularly in increasingly prevalent situations in which they are assuming a greater role in the management of water in rural areas.

In order to reach these long-term goals, IWRM must also deal with the adverse impact of the implementation of its policies, in areas such as:

- Reductions in water supply;
- Increases in the price of water;
- Reductions in irrigation coverage;
- Changes in crops cultivated.

Poor water users are particularly vulnerable to these actions, and also least able to access support or gain compensation for them.

Hence, mitigation measures are of crucial importance to address these adverse impacts. This document has outlined how such measures can best be introduced and implemented, but their implementation must be based on a detailed knowledge of the local situation, involving data and information derived from surveys and participatory assessments. The document has outlined how these can be undertaken. It has also stressed the importance of undertaken training, to build capacity for carrying out assessments, enhancing participation in decision-making on the use and management of water.

Participation needs to be enhanced both at the local level, to improve local management and implementation of other water savings measures; and at river basin level to help ensure that the overall plan takes account of social issues. Implementation of IWRM will not be successful unless these social issues are addressed. They are central to the task of water resources management, and should not be regarded as an incidental additional activity. They must be mainstreamed within the activities of the WAB.

Document Reference Sheet

Glossary:

IWRM	Integrated Water Resources Management
WUA	Water User Association
Stakeholder	Any person, group or organisation that has an interest (either directly or indirectly) in a programme, plan or project and its implementation and management

Bibliography:

D. Narayan, “The Contribution of People’s Participation: Evidence from 121 Rural Water Supply Projects”, World Bank, Washington, 1995.

Document No. 124 “Management Methods for the Special Fund for Small-scale Farmland Irrigation Scheme Construction with the Central Fiscal Fund.” NRDC / MWR (2005).

Document No. 2247 “Management Methods for Pilot Project of the Agricultural Water Supply's End Irrigation Systems' Rehabilitation.” MF / MWR (2006).

Molle (2007) River Basin Development and Management in Comprehensive Assessment, IWMI, Sri Lanka. http://www.cgiar.iwmi.org

Rogers and Hall (2003). http://www.gwpforum.org

Document Reference Sheet

Related materials from the MWR IWRM Document Series:

Advisory Note 2.1	Developing an IWRM Plan
Thematic Paper 2.2	Stakeholder Participation in IWRM Planning
Example 2.2	Initial Stakeholder Analysis for Shiyang River Basin IWRM Plan
Thematic Paper 3.1	Water Saving in Irrigated Agriculture
Advisory Note 6.1/1	Role of Water Use Associations in Water Saving in Groundwater
Advisory Note 6.1/2	Farmers Guide to Groundwater Water User Associations
Example 6.1	WUAs in Groundwater Areas
Advisory Note 6.2/1	Administrative Steps for Developing Strong WUAs
Advisory Note 6.2/2	WUA Institutional Document Guides
Advisory Note 6.2/3	Village Level Planning of WUAs
Advisory Note 6.2/4	Promoting and Training WUAs
Thematic Paper 6.3/1	IWRM, Irrigation and its Social Context
Thematic Paper 6.3/2	Assessing the Impact of IWRM on Women's Status and Conditions
Advisory Note 6.3/1	Social Monitoring
Advisory Note 6.3/2	Socio-economic Monitoring in Agricultural Water Management (Document in Chinese only)
Example 6.3	Socio-economic Monitoring for Agricultural Water Demand Management in Gansu
Thematic Paper 7.1	Multi-criterion Decision Analysis – an Introduction
Advisory Note 7.1	Using a Multi-criterion Decision Analysis for Water Resources Planning
Example 7.1	Simplified Multi-criterion Decision Analysis for the Shiyang River Basin IWRM Plan

Where to find more information on IWRM – recommended websites:

Ministry of Water Resources: www.mwr.gov.cn

Global Water Partnership: www.gwpforum.org

WRDMAP Project Website: www.wrdmap.com

China – UK, WRDMAP

Integrated Water Resource Management Documents
Produced under the Central Case Study Documentation Programme of the GoC, DFID funded, Water Resources Demand Management Assistance Project, 2005-2010.

Documents will comprise of:

Thematic Papers

Advisory Notes

Manuals

Examples

Training Materials

IWRM Document Series materials, English and Chinese versions, are available on the following project website

WRDMAP Project Website: www.wrdmap.com

6. Water Saving Society

Advisory Services by : Mott MacDonald (UK) leading a consultancy team comprising DHI (Water and Environment), HTSPE (UK), IWHR, IECCO (Comprehensive Bureau), CIAD (China Agricultural University), Tsinghua University, CAAS-IEDA, CAS-CWRR, Gansu WRHB and Liaoning WRHB.

中国水利 CHINA WATER

DFID Department For International Development

Mott MacDonald